REM IV

Remedial Planning Activities at Selected Uncontrolled Hazardous Waste Sites–Zone II

Environmental Protection Agency
Hazardous Site Control Division

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Responsiveness Summary
Combined Alternatives
Analysis Report
Northside Sanitary Landfill and
Environmental Conservation
and Chemical Corporation
Indiana

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CONTENTS

		Page
1.	Introduction	1
2.	Overview	2
3.	Community Involvement Activities	2
4.	Summary of Public Comments Received During Public Comment Period and U.S. EPA Responses	4
	4.1 Relationship between U.S. EPA and State of Indiana Efforts	4
	4.2 Status and Responsibilities of Northside Sanitary Landfill	5
	4.3 Time Frame for Initiating Cleanup	5
	4.4 Responsibility for Paying Costs	6
	4.5 Combination of the Sites	6
	4.6 Remedial Investigation Data	7
	4.7 Endangerment Assessment	15
	4.8 Hydrogeology	18
	4.9 Technologies and Costing Methods	41
	4.10 Remedial Alternative Preferences	50

Appendix A. Evaluation of Indianapolis Water Company Data
Appendix B. Bibliography of Comments Received

GLT614/27

RESPONSIVENESS SUMMARY
NORTHSIDE SANITARY LANDFILL/ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION, INDIANA

1. INTRODUCTION

The U.S. Environmental Protection Agency (U.S. EPA) has gathered information on the types and extent of contamination, evaluated remedial measures, and recommended remedial actions at the Northside Sanitary Landfill (NSL) and Environmental Conservation and Chemical Corporation (ECC) sites. As part of this process, several public meetings were held to explain the intent of the project, describe the results, and receive comments from the public. Public participation in Superfund projects is required in the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Contingency Plan (NCP). Comments received from the public are considered in the selection of the remedial action for the site. This document summarizes the comments received and describes how they were incorporated into the decisionmaking process.

The responsiveness summary has three sections:

- Section 1. Overview. This section briefly presents the U.S. EPA's recommended alternative for remediation at the Northside Sanitary Landfill (NSL) and Environmental Conservation and Chemical Corporation (ECC).

- Section 2. Background on Community Involvement and Concerns. This section provides a brief history of community interest and concerns raised during remedial planning activities at the site.

- Section 3. Summary of Public Comments Received During Public Comment Period and U.S. EPA Responses. Both oral and written comments are grouped by topics. U.S. EPA responses to these comments are also provided.

In addition to the above sections, Appendix A, included as part of this responsiveness summary, identifies the U.S. EPA evaluation of additional information obtained from the Indianapolis Water Company during the public comment period and the results of a site reconnaissance performed in June of 1987.

The detailed transcript of the Feasibility Study public meeting and the written comments are not included in the report. They are available for public inspection from U.S. EPA

Region V in Chicago, Illinois and at the repositories at the Hussey Memorial Library and Zionsville Town Hall.

2. OVERVIEW

During the public comment period, U.S. EPA presented nine alternatives in the Combined Alternatives Analysis (CAA) Report, dated December 5, 1986, to remediate the potential for exposure to contaminants from the NSL/ECC sites and the no action alternative. U.S. EPA recommended the implementation of the alternative that included access and deed restrictions on the NSL and ECC sites; capping of both sites with a RCRA compliant cap to restrict direct contact with contaminated soils, to stabilize and maintain the surface of the landfill, and to minimize infiltration of rainwater and leaching of contaminated soils; continued monitoring of the sites to verify the effectiveness of the implemented alternative; the installation and maintenance of a leachate collection system around the perimeter of the landfill; the installation and maintenance of a groundwater interception system which would collect groundwater coming from the sites before it reaches Finley Creek; the treatment of collected leachate and groundwater to remove contaminants; the rerouting of unnamed ditch to the west of the ECC site, and rerouting of Finley Creek further south of NSL. The U.S. EPA also explained that additional Preliminary Design and Design work will be conducted to aid in implementing the alternative.

Six letters were received expressing support of the U.S. EPA's alternative.

The three Potentially Responsible Party (PRP) Steering Committees, the landfill owner, and 11 other PRP's commented, in essence, that not enough information is available, or not enough of a health threat exists to take any action other than access restrictions, some form of leachate collection, capping of the landfill, and monitoring.

3. COMMUNITY INVOLVEMENT ACTIVITIES

The chronology of community involvement activities in the NSL and ECC sites is as follows:

July 21, 1983--Press release for ECC PRP Settlement.

August 23, 1984--Press release for Northside/ Enviro-Chem Public Meeting Announcement.

August 1984--Fact sheet announcing Northside RI/FS investigation distributed.

August 24, 1984--Press release for update meeting on RI activities.

September 4, 1984--Public meeting to explain planned Remedial Investigations for ECC and NSL.

March 1986--Fact sheet distributed describing results of RI's. Reports sent to information repositories, local officials and concerned citizens.

May 14, 1986--Press release for May 21 public meeting on RI's.

May 21, 1986--Public meeting held to explain RI's and take comments.

June 1986--Community Relations Plan finalized.

September/October 1986--Fact sheet updating RI/FS activities at NSL and ECC distributed.

December 1986--Fact sheet distributed to announce recommended alternative. Fact sheet described alternatives considered.

December 5, 1986--Press release for public meeting December 17, 1986 for FS.

December 17, 1986--Public meeting held to explain FS and take comments.

February 4, 1987--Press release announcing comment period extension for FS's.

February 18, 1987--Public comment period extended at request of State, citizens' groups, and PRP's.

February 28, 1987--Public comment period ends. Comment period lasted 78 days.

Telephone contact was maintained with local officials, citizens' groups, and media throughout the RI/FS. Press releases and fact sheets were distributed to media, local officials, and residents on U.S. EPA's mailing list. Fact sheets and reports were sent to repositories at the Hussey Memorial Library and Zionsville Town Hall. The Indiana Department of Environmental Management (IDEM) participated in the public meetings.

Several PRP's requested that the public comment period be extended by periods ranging from 30 days to 6 months. The comment period was originally set for 55 days after the public meeting on the FS, rather than the required 21 days, to accommodate expected public interest. The ECC and NSL Remedial Investigation (RI) Reports, which were the subject of a public meeting on May 21, 1986, contain the results of

sampling activities and the evaluation of potential public health threats and environmental effects. The RI's were available for 278 and 265 days, respectively, prior to the December 17, 1986 public meeting on the FS's. These data were used to develop the FS's. The FS's were available for 5 days prior to the December 17, 1986 public meeting. After the public meeting on the FS's the comment period was extended by an additional 18 days for a total of 78 days. A longer extension was not feasible given the U.S. EPA's commitment to make a decision in the 1987 fiscal year and to move ahead with the remediation of NSL/ECC as quickly as possible.

4. SUMMARY OF PUBLIC COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD AND U.S. EPA'S RESPONSES

Comments raised during the NSL/ECC Feasibility Studies (FS's) and Combined Alternatives Analysis (CAA) public comment period are summarized. The comments received during the public comment period are categorized by the person, forum or company for whom the comment was prepared.

There were a number of comments submitted on liability for remediation of the sites. These comments are not considered to be germaine to the selection of the remedy and are beyond the scope of this Responsiveness Summary. There were also a number of comments submitted on regulatory requirements and ARAR's. These are specifically addressed in the Record of Decision. A bibliography of comments received is included as Appendix B.

4.1 RELATIONSHIP BETWEEN U.S. EPA AND STATE OF INDIANA EFFORTS

Comment. Has the U.S. EPA worked with the State of Indiana to prepare the FS and CAA reports? Are the alternatives favored by U.S. EPA and the State of Indiana compatible? Does the Indiana Department of Environmental Management (IDEM) now agree with U.S. EPA's findings? (NSL/ECC December 17, 1986 Public Meeting)

U.S. EPA Response. The State of Indiana has reviewed drafts and commented on the FS's and CAA documents and their comments were incorporated. There have also been several meetings between the U.S. EPA and IDEM, and frequent contact between the U.S. EPA and IDEM representatives for the site. The IDEM has been involved in the remedy selection process and believes that the U.S. EPA's Recommended Alternative is a viable option for remediating both sites.

On December 16, 1986, the State of Indiana sent official notification to the U.S. EPA of its concurrence with the remedy.

4.2 STATUS AND RESPONSIBILITIES OF NORTHSIDE SANITARY LANDFILL

Comment. Will NSL continue to operate during construction? Will the landfill be closed? Will the landfill remain in its current location? Why should NSL be included in the plans for remediation? What levels of contamination indicate that NSL should be included in the remediation plans? (NSL/ECC December 17, 1986 Public Meeting)

U.S. EPA Response. Implementing the remedial alternative proposed would necessitate closing of the landfill. The landfill would remain in its present location and be capped with a fence around it and leachate and groundwater collection systems in place. There would also be a treatment plant to treat collected groundwater and leachate.

During the remedial investigations contaminants were found in the monitoring wells at concentrations which exceed criteria for the protection of human health and environment. Concentrations of contaminants were also found in surface water samples which exceed criteria for the protection of human health and the environment.

The concentrations of contaminants found in the monitoring wells and surface water can be found in Appendix Tables A-4, A-7, and A-8 Volume 1 of 2 NSL Final RI.

4.3 TIME-FRAME FOR INITIATING CLEANUP

Comment. How long will it be before the actual site cleanup begins and can the time-frame be expedited? Can the U.S. EPA start the remedy after the Record of Decision (ROD) is signed and before an agreement is reached with PRP's? Is there a time limit on negotiations, after which cleanup will begin? (NSL/ECC December 17, 1986 public meeting)

U.S. EPA Response. Assuming that negotiations with PRP's are completed, the ROD is signed and the design is finished it could take from 1 to 2 years to construct the groundwater interception system and 2 to 5 years to construct the RCRA cap.

As long as the U.S. EPA is still negotiating with the PRP's the implementation (actual construction) of a remedy will not begin. The U.S. EPA will give the PRP's a reasonable opportunity to negotiate a settlement but it is not going to be open ended. The U.S. EPA recognizes the concern about deciding whether the PRP's or the U.S. EPA will do the remediation.

4.4 RESPONSIBILITY FOR PAYING THE COSTS

Comment. After any necessary allocations have been made, the cost attributable to any nonsolvent PRP should be borne by the U.S. EPA.

Who will pay the cost of the cleanup, the potentially responsible parties (PRP's) or the taxpayers? Are the PRP's that previously settled released from liability? Why weren't all PRP's given the chance to settle at that time? (Mersman; NSL/ECC December 17, 1986, public meeting)

U.S. EPA Response. Under the Superfund law the U.S. EPA will take every course available to negotiate settlements. Where need be the U.S. EPA will take enforcement action against PRP's and may draw on the fund set aside by Superfund.

In 1982 the Enviro-Chem site was covered with stacks of drums and tanks containing hazardous waste. The U.S. EPA was focusing on that acute problem so a settlement was reached with the known PRP's for surface cleanup purposes.

Not all of the known PRP's participated in the cost of surface cleanup at Enviro-Chem. The PRP's that did participate in the surface cleanup were released from liability for further surface work, but they are not released from liability for the groundwater problem.

The U.S. EPA found out about other ECC PRP's at later date.

4.5 COMBINING THE SITES

Comment. The application of CERCLA section 104(d)(4) to combine the NSL and ECC sites is inappropriate. It appears that the only groundwater contamination involved is that which is attributable to the NSL site.

Although location of the two sites may be relevant to some circumstances, these are essentially two different sites, and combination is inappropriate.

Groundwater contamination levels are much greater for ECC than NSL, the two areas are vastly different in size, hence the closure of the ECC site should be accomplished separately from the NSL site (Mersman; Ferro Corp.; NSL Steering Committee; ECC Steering Committee).

U.S. EPA Response. The proximity of the two sites to each other is one major reason for combining the sites and implementing an overall remediation for both. A second consideration is the contaminated environmental media are common to both sites, such as groundwater and surface water, and the difficulty of identifying the source (ECC or NSL) of

some of the observed groundwater and surface water contamination. Similar chemicals, byproducts, and waste were either stored or disposed of at both sites. Also since both sites had similar status with respect to regulatory permits, remediation needs for both sites are similar and combination of the sites for the purpose of remediation seems reasonable.

A third consideration is that a combined remedy is more cost-effective than two individual remedies for these sites. The monitoring system, the groundwater collection system, and the treatment system are cheaper to design and operate if the sites are combined. The combined remedy will be equally as protective of human health and the environment as two separate remedies.

4.6 REMEDIAL INVESTIGATION DATA

Comment. The detection levels presented in Appendix A of the NSL RI Report dated March 27, 1986, are higher than some of the results reported elsewhere with lower values [sic]. For example, a value of 4 ug/l for benzoic acid was reported when the detection limit is given as 50 ug/l. This is misleading and these types of results should be reported as 4±50 ug/l, so as not to provide a misconception of water quality.

It is truly questionable to consider enforcing minimum levels for constituents found in the groundwater and leachate whose minimum criteria is 151 to 4,000 times lower than the detection limit (NSL, Inc.; Ferro Corp.).

U.S. EPA Response. The detection limits cited in the RI's are contracted for through the U.S. EPA's Contract Laboratory Program. In actuality the more proper name would be contracted quantification limit. The technology exists by which the concentration of a contaminant in water can be quantified down to the nanogram per liter level or roughly part per trillion level or less depending on the compound of concern. Even at these lower levels a compound can be detected and positively identified but the concentration may have to be estimated which is then indicated by a J qualifier in data summary tables. The criteria is based on the observed effects certain compounds have on various organisms or projected effects the compounds could have on humans based on animal laboratory experiments.

Comment. The similar compounds detected in Finley Creek are not supported by the analytical data from ECC monitoring well samples, are not directly related to the ECC site, and do not constitute a valid reason for requiring interception and treatment of groundwater (ECC Steering Committee).

U.S. EPA Response. The similar compounds detected in Finley Creek were found not only in ECC monitoring well samples, but also in ECC subsurface soils and in the contaminated water samples taken from under the concrete pad on the southern end of the ECC site and from the sump in the same location.

Compounds similar to those observed in the NSL monitoring well samples, subsurface soil samples and leachate tank samples are also detected in Finley Creek.

Comment. There are discrepancies in the analytical results due to poor quality control.

All analytical results where field blanks showed substantial contamination should be stricken from the tables in the reports.

Methylene chloride is not present due to the site, but rather is an artifact of the sampling and analytical procedure (Jones, Inc.; TRW Inc.; NSL Steering Committee).

U.S. EPA Response. The analytical results presented in the RI's and FS's have been reviewed and qualified. The specific use of contaminant concentrations with a J qualifier is acceptable. The J qualifier means that the compound was present but that the concentration of the contaminant in the environmental media is estimated. It does not mean that the compound was not present.

The presentation of all reportable data is important so that decision makers and concerned parties have a complete data base from which to form an opinion on remediation needs.

Methylene chloride is listed as a specific waste product disposed of at the NSL site. It is also listed as a frequent laboratory contaminant. In some samples methylene chloride concentrations were an order-of-magnitude higher than would be expected from laboratory contamination. It is difficult to completely discount or verify that methylene chloride in the various environmental media is or is not coming from the site. Therefore, the concentrations of methylene chloride detected in the various environmental media during the RI are reported.

Comment. Considerably more oil and grease was found in surface water sediments upstream of NSL than downstream [sic].

Of 10 downstream surface water sediment samples eight had lower concentrations of lead [sic]; thus, the source of lead cannot be attributed to NSL, simply because it was found at a higher concentration downstream (Tricil).

U.S. EPA Response. During Phase I and II of the RI, sediment sampling point SD001 is located upstream on unnamed ditch and SD002 is upstream on Finley Creek. During Phase I sampling the oil and grease concentration at SD001 was 600 mg/l and the first sampling point downstream on unnamed ditch at SD010 had a concentration of 190 mg/l; hence in Figure 4-28 of the NSL RI it is noted that the concentration of oil and grease in unnamed ditch is not above background. SD001 is an upstream sampling point for unnamed ditch and is not an upstream sampling point for Finley Creek.

The upstream Phase I sampling point in Finley Creek SD002 had an oil and grease concentration of 350 mg/l. All Finley Creek sampling locations adjacent to and downstream of NSL (5 points) had oil and grease concentrations ranging from 400 to 580 mg/l which is a 14 to 66 percent increase over the Finley Creek upstream concentration.

During the Phase II sampling period oil and grease was quantified at one point in Finley Creek above upstream concentrations as was one point in unnamed ditch. This is also shown in Figure 4-28 of the NSL RI.

Lead is present in the upstream Phase I sediment samples on both unnamed ditch and Finley Creek at concentrations of 10 and 8.6 mg/kg, respectively. In Phase I, samples taken adjacent to and downstream of the site had lead sediment concentrations ranging from 13 to 31 mg/kg and exceeded the upstream concentrations by 30 to 210 percent. Phase II downstream lead sediment concentrations that range from 23 to 37 mg/kg exceed the upstream concentrations of 16 mg/kg in unnamed ditch and 12 mg/kg in Finley Creek by 50 to 130 percent.

These data suggest that there is a contribution of oil and grease and lead between the sampling locations upstream of NSL and sampling locations adjacent to and downstream of NSL.

Comment. No information is provided regarding the form of cyanide present (in surface water). Cyanides were not found in any other sampling media (at NSL). Therefore, cyanides cannot be attributed to the NSL site, and any EPA identified risks due to its presence are invalid [sic] (NSL Steering Committee).

U.S. EPA Response. The samples were analyzed for total cyanide. Cyanide was found in a sediment sample shown on Figure 4-28 and in groundwater samples shown on Figure 4-34 and 4-84 of the NSL RI. As shown on Figure 4-24 of the NSL RI, cyanide was not detected in surface water samples upstream of the NSL site. The criteria for the protection of aquatic life from acute or chronic effects of cyanide are 22 and 5.2 ug/l, respectively. The surface water concentrations

observed in Finley Creek exceed the criteria; therefore, the risks identified are not invalid.

Comment. It is unclear if concentrations of lead, PCB's, or pesticides in soil or sedimentation can be linked directly to the landfill (Tricil).

U.S. EPA Response. Lead does not occur at elevated concentrations in upstream sediment or background soil samples. PCB and pesticide concentrations above detection limits occur only adjacent to and downstream of NSL. This indicates a positive relationship between the landfill and sediment concentrations.

Comment. The (ECC RI) report assumes that the presence of any organic compounds show contamination from the ECC site. No attempt was made to characterize the true background at the site. All historical sample tables must be stricken unless it can be established that the conditions are the same today as they were on the dates of historical sampling. Some samples are almost 8 years old (TRW, Inc.).

U.S. EPA Response. In the ECC RI the chlorinated hydrocarbons found in the groundwater in the shallow saturated zone, shallow sand and gravel zone, ECC soils, unnamed ditch sediments, Finley Creek sediments, and Finley Creek surface water are stated as likely to be from ECC. There is no assumption that the presence of any organic compound offsite shows contamination from ECC.

Table 4-4 ECC RI shows background concentrations for a number of contaminants.

The historical information is presented for site background purposes and historic perspective. The information is not used to describe the nature and extent of contamination at the site as it existed during the remedial investigations. Therefore, there is no need to strike the historical tables.

Comment. The ECC RI Table 3-9 does not indicate depths of monitoring wells for historical data. Depths of residential wells are not indicated (TRW, Inc.).

U.S. EPA Response. The ECC Monitoring well (MW) No. 1 is 70 feet deep and ECC Monitoring well (MW) No. 2 is 36 feet deep. The locations of MW1 and MW2 are shown on Figure 3-5 and the well depths are listed in Table 3-8 of the ECC RI and in Appendix F of the NSL RI. Available residential water well records from adjacent townships around ECC and NSL are also included in Appendix A Technical Memorandum No. 7 Volume 2 of 2 NSL RI. There are also boring logs for the NSL monitoring wells included in Appendix C of Technical Memorandum No. 4 Volume 2 of 2 NSL RI.

Comment. The dilution factor of 20 to 1 on ECC FS page 1-3 is too low and inconsistent with the 1,300 to 1 dilution stated on page 6-12 (Tricil).

U.S. EPA Response. The 20 to 1 ratio is calculated on an areal basis. Finley Creek's watershed is approximately 10 square miles in extent; Eagle Creek Reservoir is fed by a watershed of approximately 170 square miles. Hence 170 to 10 is 17 to 1 or 20:1 rounded off. Water that is already in Finley Creek could be diluted 20 times by the time it reaches Eagle Creek Reservoir.

The 1,300 to 1 dilution ratio is also calculated on an areal basis. The ECC/NSL drainage area is about 0.12 square miles. Eagle Creek Reservoir's drainage area is 160 square miles. Hence 160 to 0.12 is 1,300 to 1 rounded off. Therefore, water that comes from the sites could be diluted 1,300 times by the time it reaches Eagle Creek Reservoir.

Comment. References to ECC soils should be stricken unless U.S. EPA can establish that these soils existed after the 1983-84 remedial work.

All references to site conditions which no longer exist should be stricken.

The inclusion of descriptions of samples taken on the surface of ECC lacks many details. If these samples of soils are not representative then they form an insubstantial base on which to rest the conclusion that an FS is necessary.

The conclusion that there is a source of exposure from the migration of chemicals through the shallow sand and gravel aquifer (at ECC) must be stricken since it is also stated that the alteration of the site characteristics during surface cleanup has made this an unlikely migration pathway presently or in the future.

Results of the ECC RI do not reflect conditions upon which additional remedial action could be based since the RI was conducted over the same time span as initial remedial actions.

The effect of remedial measures already undertaken at ECC have not been evaluated. Thus there is no way of quantifying the current potential risk posed by the site and the need, if any, for additional remedial actions.

The statement that analytical results of the (ECC) RI characterize current site contamination is erroneous in that extensive remedial actions were completed at the site and these have not been taken into account (TRW, Inc.; Tricil).

U.S. EPA Response. The Phase II soil samples were taken after the surface cleanup activities were completed (see page 3-32 of the ECC RI), refer to Soil Investigation Memorandum Subtask 3-4 in Appendix A ECC RI Volume 2.

These data were used to evaluate the nature and extent of contamination and risks attributable to ECC site soils. The soil samples taken during this Phase II of the RI are shown in Figure 4-2 of the RI. Therefore, the contaminated subsurface soils at ECC still exist.

The description of historic site conditions are helpful to the reader to understand past activities which have contributed to the existing contamination on the ECC site, and the past removal activities as outlined on pages 3-32 through 3-37 of the ECC RI.

The samples taken on the surface of ECC during the December 12, 1984, Phase III monitoring well sampling trip were not soil samples but surface water samples of ponded water on top of the cover which was placed on the northern portion of the ECC site when surface cleanup activities were completed in August of 1984. Page 4-60 of the ECC RI gives details of the sampling of ponded water, Figure 4-22 shows the sampling locations, and Tables 4-16 and 4-18 show the analytical results. Because of the presence of chlorinated organic compounds and the location of the ponded water on top of the cover at ECC, the most feasible source would be contaminants in the soils below the ponded water.

U.S. EPA did not conclude that migration through the shallow sand and gravel aquifer is an unlikely migration pathway. Rather, as noted in Table 4-13 and on page 4-55 of the ECC RI, the shallow sand and gravel aquifer (at ECC) is presently contaminated based on samples taken in November and December of 1984 after surface alterations were completed in August of 1984.

U.S. EPA did conclude that migration from the shallow saturated zone to the shallow sand and gravel zone is presently an unlikely migration pathway due to the upward vertical gradient.

The endangerment assessment takes into account the existing conditions at the ECC site which includes initial remedial measures which were completed by August of 1984 (see page 6-10 ECC RI). Therefore, the risks presented are for the no action scenario as of the date of the RI.

In summary the initial remedial measures taken at the ECC site are accounted for and the analytical results used in the RI do characterize the existing nature and extent of contamination at the ECC site.

Comment. It is stated that contaminants in surface water will either volatilize, adsorb to sediments, or experience large dilutions before reaching Eagle Creek Reservoir. Therefore, statements on exposures through these routes should be stricken. There is no basis for the conclusion or assumption that if contaminants reach the reservoir then users of the reservoir would be at risk. No attempt was made to assess the effects of dilution or to determine the risk scientifically [sic]. No contaminants have been found in Eagle Creek (CAA page 1-8). If none are in the creek, none can reach the reservoir (TRW, Inc., Tricil).

U.S. EPA Response. It is true that, once they reach surface water, contaminants can volatilize, adsorb to sediments or be diluted. The exposures noted in the RI's are based not only on projected concentrations but observation of existing concentrations in Finley Creek. The risks identified in Finley Creek are mitigated by implementing the recommended alternative. Mitigation of the identified risks in Finley Creek also protects the drinking water source, Eagle Creek Reservoir.

Comment. Water quality criteria should not be applied to groundwater or leachate directly, but to the receiving stream after dilution. Indiana regulations have been misapplied. "A" mixing zone is defined as: "An area contiguous to a discharge where the discharged wastewater mixes with the receiving waters. Where the quality of the effluent is lower than that of the receiving waters, it may not be possible to attain within the mixing zone all beneficial uses which are attained outside the zone. The mixing zone should not be considered a place where effluents are treated. 330 IAC 1-1-10." Consideration should be given to reclassify Finley Creek for limited use (NSL Steering Committee; Tricil).

U.S. EPA Response. Indiana's present use designation for Finley Creek is partial body contact and warm water fishery. Reclassification of Finley Creek to a lower use designation is against the State of Indiana's nondegradation policy.

A point-discharge of effluents to Finley Creek must meet potential Indiana NPDES requirements which would reflect Finley Creek's periodic low flow (which recurs on the average of every 10 years and lasts for 7 days)--(Q_{7-10}) of zero to 0.1 cubic feet per second. Indiana regulations do not allow a mixing zone under these conditions, so there would be no allowable reductions in the NPDES requirements resulting from dilution in the receiving stream. The criteria which would be applicable for a point-discharge and/or treatment are, therefore, as presented in the ROD Table 1.

Comment. Methylene chloride in the water samples is not present due to the NSL site, but is an artifact of sampling and analysis. Therefore, U.S. EPA should not use the presence of methylene chloride in the water samples to evaluate risk (NSL Steering Committee).

U.S. EPA Response. Table 6-8 of the NSL RI shows that organic contaminants other than methylene chloride exceeded drinking water standards and guidelines, including MCL's, MCLG's, and CWA WQC's for human health (adjusted for drinking water). Table 6-9 of the NSL RI presents assessments of risk associated with drinking groundwater at the NSL site for organic contaminants other than methylene chloride.

Comment. Unless EPA can establish that these soils existed after the 1983-84 remedial work, all reference to these soil sample results must be stricken as irrelevant. Reference to the cooling water pond should be stricken because it was removed in 1983-84 removal work [sic] (TRW, Inc.).

U.S. EPA Response. As stated in the ECC-RI, review of soil laboratory results from samples taken after surface cleanup activities show that inorganic contamination exist to depths of 3 to 5 feet, and organic contamination as detected to a soil depth of 8.5 feet. In spite of the removal of surface soils in 1983-84, there still exists soil contamination onsite. In addition, the "On Scene Coordinator's Report" prepared by Roy F. Weston Inc. (June 14, 1985) explains that the cooling pond was backfilled with contaminated soil excavated from around the process building.

Comment. No attempt was made to characterize what the true background of organics is at the ECC site [sic] (TRW, Inc.).

U.S. EPA Response. The organic compounds detected at the ECC site are man-made, are not naturally occurring, and their presence indicates the impact of man's activities.

Comment. In Table 5-6 of the ECC RI, estimated concentrations of volatiles in Finley Creek, which are indicated to vary with the flowrate, vary by a factor of 10. The flow of Finley Creek varies by a factor of 40. No explanation is given for this discrepancy (Tricil).

U.S. EPA Response. Based on the available data, the flow in Finley Creek varies from less than 0.1 cfs to 4 cfs--which corresponds to a ratio of 40. However, throughout most of the year, the flow ranges from 0.1 cfs to 1 cfs--which corresponds to a ratio of 10. The latter flow range was used to calculate the concentrations in Finley Creek since it provided a more realistic estimate.

4.7 ENDANGERMENT ASSESSMENT

Comment. It is arbitrary and capricious to assume that EPA would not take every effort to prevent the existing conditions at the site (Jones Chemicals, Inc.). EPA would never allow residences to be built on the site nor an occupational use to occur on the site without some sort of remediation (TRW, Inc.). It is unreasonable, arbitrary and capricious to assume that no fencing, deed notices or use restrictions would be placed on this property (Ferro Corp.).

The endangerment assessments are based on unrealistic scenarios. The EPA identified risks associated with offsite surface water, stream sediments, and groundwater are invalid. Although the report speculates that receptors could contact the groundwater if potable wells are constructed within the zones of contamination, the likelihood of that is extremely small. There is no factual basis on which to state that ingestion of fish is an exposure route in this situation (Jones, Inc.; TRW, Inc.; Ferro Corp.; ECC Steering Committee; Tricil; NSL Steering Committee).

U.S. EPA Response. As discussed in the RI and FS reports, the Endangerment Assessment is performed on the No-Action Alternative. That is, the Endangerment Assessment must assume that the site remains as it is at present, and that no remedial actions have been initiated.

The U.S. EPA cannot take any action at a site unless an unacceptable risk to human health and the environment is identified. The site presently has all uses evaluated in the Endangerment Assessment existing either onsite or adjacent to it. The area around the site is also zoned for those uses (ECC RI Figure 6-1 and NSL RI Figure 6-2). The surface water in Finley Creek has a present use designation for partial body contact and warm water fishery which means the general public can wade in the stream and practice recreational fishing which is assumed to include consumption of fish caught. Therefore, it is not arbitrary and capricious to evaluate potential exposure using a residential and occupational scenario.

The ingestion rates used in the Endangerment Assessment for water and fish are published in guidance documents. The ingestion rate for soil averages out to be about 9 ounces a year for the residential scenario and about 1/10 of an ounce a year for the occupational scenario. The ingestion rate for fish averages out to be about 5 pounds a year. None of these ingestion rates can be considered overly conservative nor are they arbitrary or capricious.

The dermal absorption rate used reflects the skin's ability to absorb lipophylic compounds. The rate used was experimentally measured not only by the loss of solute but also by indirect methods such as byproducts in urine and expired air. The presentation of risks from dermal absorption of contaminants in surface water and from bathing is to recognize that this potential exposure route exists and adds to the total potential risks from the site.

Comment. The substantial health concerns and environmental impacts of the proposed alternative have not been addressed nor has the functional equivalent of an environmental impact statement pursuant to NEPA been provided (Jeffboat; Rock Island Refining).

U.S. EPA Response. Remedial actions taken pursuant to Sections 104 and 106 of CERCLA are generally exempt from NEPA requirements because the EPA has determined that these RI's/FS's, are the functional equivalent of an Environmental Impact Statement (EIS).

The U.S. EPA believes that the remedy screening and selection process used in the Feasibility Studies and Combined Alternatives Analysis for the sites meet CERCLA Section 105(3) and Section 300.68 of the NCP satisfy NEPA requirements.

The U.S. EPA believes also that the various press releases, fact sheets, public meetings, and lengthy public comment period satisfy the public involvement requirements of NEPA.

Comment. Does the U.S. EPA believe the following findings from the Northside Landfill FS to be true or false:

- That the current risk from leachate is negligible?
- That current concentrations of contaminants do not suggest a threat to aquatic life in Finley Creek?
- That the groundwater believed to be discharged at Finley Creek presents negligible risk from offsite migration?
- That the surface water near the site does not currently pose a threat to human health?

(NSL/ECC December 17, 1987 Public Meeting)

U.S. EPA Response. The Endangerment Assessment in the NSL RI states: "Comparison of current surface water concentrations to Ambient Water Quality Criteria and 96-hour LC50 values does not indicate any chemicals which exceed those criteria." This statement is made in reference to Table 6-13 NSL RI and is specific to organic chemical criteria as they

relate to aquatic life. The table does not reflect what discharge limits of treated effluent would be with respect to NPDES requirements nor are inorganic water quality criteria or water quality criteria for the ingestion of aquatic organisms for the protection of human health presented.

The statement on page 3 of the NSL FS is a summary of the Endangerment Assessment in the NSL RI. The statement: "Discharge of contaminated groundwater, at current concentrations, to surface waters does not present a threat to aquatic organisms..." on page 1-21 is in reference to aquatic life criteria specific to organic chemicals and not inorganic chemicals or human health criteria or ingestion of aquatic organisms.

Table 4-2 of the NSL FS and Table 2-4 of the CAA present potential limits for discharges to Finley Creek for organic and inorganic chemicals for the protection of aquatic life and protection of human health from ingestion of aquatic organisms from Finley Creek.

Comment. The generic Ambient Water Quality Criteria used for polyaromatic hydrocarbons (PAH's) in Table 2-4 of the CAA assumes that phenanthrene and naphthalene are a PAH mixture and that to be conservative the criteria for benzo(a)pyrene is used. In this situation the criteria of 0.0311 ug/l quoted are simply not applicable (NSL, Inc.).

U.S. EPA Response. The U.S. EPA agrees that both phenanthrene and naphthalene are currently not considered carcinogenic polycyclic aromatic hydrocarbons (PAH's). However, the International Agency for Research on Cancer (IARC) has not evaluated the risk to humans associated with oral ingestion or inhalation for naphthalene and there was insufficient evidence of carcinogenic risk to humans for phenanthrene. The U.S. EPA Carcinogen Assessment Group (CAG) considers the evidence for carcinogenicity of phenanthrene and naphthalene to be inadequate and have assigned them to Group D--not classified chemical.

The criteria presented for phenanthrene and naphthalene in Table 2-4 of the CAA are not considered ARAR's which are listed in Table 1 of the ROD. The actual discharge limits will be established during the NPDES process.

Comment. "On page 3-10 of the NSL FS, the reasons for rerouting the unnamed ditch and Finley Creek are that: "This would route the surface waters away from contaminated areas and increase the travel time for contaminants to migrate to surface waters. Relocating the surface waters would also allow monitoring wells to be installed between Finley Creek and the contaminated areas." There are no current U.S. EPA identified risks due to migration of groundwater to surface waters

or to direct contact with surface waters. Therefore, rerouting the surface waters is unjustified (NSL Steering Committee).

U.S. EPA Response. Groundwater in some of the existing monitoring wells exceed ARAR's (see ROD Table 1). The discharge of the groundwater to surface waters would also exceed ARAR's (see ROD Table 1). The relocation of unnamed ditch and Finley Creek are necessary to implement Alternative 5 because the monitoring system necessarily has to be installed between the groundwater interception system and Finley Creek to verify the system is performing correctly.

Comment. The U.S. EPA identified risks due to pesticides in leachate sediments, water sediments, subsurface soil, and sand and gravel groundwater in the southwest corner of the landfill are due to the prior use of the NSL area as agricultural land and not to the landfill operation (NSL Steering Committee).

U.S. EPA Response. The NSL site has been a open dump/landfill since sometime between 1955 and 1962 (page 3-9 NSL RI). Agricultural use of the site ceased sometime between 1962 and 1972 based on aerial photographic interpretation. Pesticide concentrations in upstream surface water sediments, upstream soil samples and groundwater samples have consistently shown no pesticides above detection limits. Even if pesticides resulted from prior agricultural uses there are numerous other contaminants observed at the site which are not attributable to agricultural use.

4.8 HYDROGEOLOGY

Comment. A french drain system in the shallow saturated zone at the ECC site is inappropriate because there is no basis for the assumption that the zone is generally contaminated. Several invalid assumptions were made with regard to the french drain system in the ECC FS (ECC Steering Committee; Tricil).

U.S. EPA Response. Contaminants were detected in samples of the soil and groundwater taken from the shallow saturated zone over the extent of the ECC site. The french drain system was proposed in the ECC FS to prevent these contaminants from migrating outside of the site boundaries.

Calculations and assumptions related to the french drain system are presented in Appendix B of the ECC FS. Flows to the drains were estimated from the expected recharge to the soil unit from precipitation and from upward leakage from the underlying sand and gravel unit. Assumptions on aquifer homogeneity, isotropy, and height of water table above the drain were made to estimate drain spacing and not to estimate flow to the drains.

Comment. Groundwater contaminant concentrations projected to result from leaching of soil contaminants at ECC (ECC RI Table 5-5) assume that soil concentrations will not change with time. Therefore, the projected groundwater concentrations are overestimated because the soil contaminants will degrade (ECC Steering Committee).

U.S. EPA Response. Discussions of the degradation of soil contaminants at ECC are presented in Appendix C of the ECC RI, and a summary of environmental behavior of organic compounds in surface soils is presented in Table 5-4 of the ECC RI. This table indicates that some degradation and transformation process are insignificant while others are possible and even significant. Degradation processes depend on site-specific conditions and are difficult to quantify. Therefore, for the purpose of estimating groundwater concentrations resulting from leaching of soil contaminants, it was assumed that degradation of soil contaminants would be insignificant.

Comment. The estimated travel times to surface water of contaminants from ECC are longer than the expected degradation times of the contaminants. Therefore, the projected concentrations in surface water resulting from discharge of contaminated groundwater are overestimated, and do not reflect any degree of imminent hazard from the site (ECC Steering Committee; TRW, Inc.; Tricil.

U.S. EPA Response. The travel time of 300 and 800 years for TCE at ECC are estimates of travel time from the northwestern portion of the site to the unnamed ditch and Finley Creek (ECC RI, page 5-13). The estimated travel time for TCE from the eastern portion of the site to the unnamed ditch ranged from 20 to 100 years. This was based on a hydraulic conductivity of 10^{-5} cm/sec, and would be an order-of-magnitude less using an hydraulic conductivity of 10^{-4} cm/sec. On page 5-13 of the ECC RI, it is acknowledged that TCE will experience some degradation if aerobic conditions exist, but on page C-2-3 of Appendix C it is stated that rates of biodegradation are difficult to estimate on a site-specific basis. Given these considerations, the implied degradation time of 10 years can be considered to be the same order-of-magnitude as the fastest travel-time estimate of 20 years.

It should be recognized that some volatile organic compounds degrade into more conservative, toxic, or carcinogenic compounds. The more conservative degradation products would travel faster to the surface water than the original organic compounds. An example is TCE degrading to vinyl chloride.

Comment. The estimated hydraulic conductivity of 10^{-6} cm/sec for the glacial till at NSL does not agree with other estimates of the till hydraulic conductivity; specifically with

estimates of 10^{-8} to 10^{-9} cm/sec by West (cited in the NSL FS, pages 1-11 and B-1). It is not clear why the sand and gravel water bearing unit of NSL has a lower limit of hydraulic conductivity lower than that of the glacial till [sic] (Tricil).

U.S. EPA Response. Measured hydraulic conductivity values are presented in Table B-1 in Appendix B of the NSL FS. The hydraulic conductivities presented in the table are for wells which were screened across various lithologic units. Most of the test zones included some lenses or units of coarse grained soils other than clay or silt till. Therefore, the hydraulic conductivity values for till reported in the NSL FS would be higher than values reported for samples consisting completely of clay or silt till, as were the samples tested by West.

The lowest hydraulic conductivity value reported in NSL FS Table B-1 is 5.8×10^{-5} cm/sec for well 11D (the low end of the range). This is a higher value than the 10^{-6} cm/sec cited in the comment as the hydraulic conductivity of the glacial till.

Comment. No source is given for the effective porosity value of 0.10 used for glacial till (Tricil).

U.S. EPA Response. Davis and DeWiest (Hydrogeology, John Wiley & Sons, 1966) state that most porosities of till fall in the range of 25 to 45 percent (page 409). Accepting this, it is not unreasonable to assume that the effective porosity of a very dense (compact) glacial till would be on the order of 10 percent (0.10).

Comment. No wells were installed upgradient and beyond the influence of the landfill. The absence of background data makes it impossible to quantify the impact of the NSL site (Tricil).

U.S. EPA Response. It is true that there are no wells immediately upgradient of NSL and beyond the influence of the landfill. However, there are wells upgradient of the neighboring ECC site which are beyond the influence of the landfill. Shallow well ECC 1A is located northwest of the ECC site, and shallow well ECC-2A is located at the northeast corner of ECC. Sampling results from these wells may be compared to those from wells downgradient of NSL.

Comment. No attempt has been made to differentiate contaminants commonly found in municipal waste from those which are solely attributable to the hazardous waste allegedly disposed of in NSL. The volumes of hazardous waste received by NSL have been overestimated, and little or none of the hazardous substances may remain in the landfill. Drums have not been

placed in NSL since 1983, and the 3 acre oil pond was removed 10 years ago [sic]. There is no evidence that any intact drums containing hazardous waste are buried in the landfill. If drums were disposed of, it is probable that they were ruptured by heavy equipment (NSL, Inc.; Tricil).

U.S. EPA Response. The estimates of hazardous waste received by NSL were the best available at the times of the RI's. It is true that no attempt was made to differentiate contaminants from municipal and hazardous wastes. It is likely that many of the contaminants from hazardous waste would be similar in type to those from municipal waste, which would make their differentiation difficult. Given the site-specific information in the RI reports and in the comments, it is difficult to determine if the 4 to 10 year period cited in the comment is sufficient time for all contaminants from drums and the oil pond to have moved out of the landfill.

Comment. No indication is given as to how estimates of volatile organic concentrations in groundwater at ECC, resulting from the leaching of soil contaminants, compare to actual measured values. Methods used to estimate concentrations should be presented (TRW, Inc.; Tricil).

U.S. EPA Response. Estimated concentrations of volatile organics in groundwater due to leaching from the unsaturated soil are presented in ECC RI Table 5-5, and results of groundwater monitoring are presented in Table 4-13. The estimated average concentration of TCE due to leaching was 200,000 ug/l. TCE was detected in well 11A (completed in the shallow saturated zone adjacent to the south boundary of ECC) at a concentration of 28,000 ug/l. Other volatile organics for which concentrations were estimated were not detected in well 11A. The TCE concentration detected in the well was 15 percent of the estimated average concentration, but this may be due to the location of the well along the site boundary rather than in the middle of the site. Methods used to estimate concentrations are presented in Chapter 5 and Appendix C of the ECC RI, and in Appendix A of the NSL FS.

Comment. Data in the remedial investigation reports do not suggest any present substantial threat from groundwater contamination at NSL (other than in the immediate area of the landfill), nor do the reports show that the landfill has or ever will present a problem. The landfill has been in existence for 20 years, and it is not unreasonable to think that substantial problems should have occurred already. There is no justification presented in the reports for the stated expectation that contaminant levels would increase over time to a maximum level, and that the time period before which concentrations permanently decrease to nonhazardous levels may be 100 years or longer. The landfill may already be in the stage where the concentration levels are decreasing. The

nature and extent of the sources of contaminants within the landfill are not well known, nor do the reports describe reasonable mechanisms for future contaminant releases from the landfill (NSL Committee; NSL, Inc.; Tricil; Chrysler).

U.S. EPA Response. Elevated levels of total dissolved solids (TDS) were detected in groundwater monitoring wells screened in sand units at the southwest corner of NSL, and in one well near the southeast corner of NSL. These elevated TDS levels indicate that some leachate has migrated to the groundwater from some portions of the landfill. Also, organic contaminants were detected in some of the monitoring wells downgradient of NSL. As these organic contaminants are not expected to occur in ambient groundwater, their presence is interpreted as an indication of contaminant release from NSL. Refer to Tables A-7 and A-8 in Appendix A of the NSL RI for details of contaminants detected in the monitoring wells.

Analyses of surface water samples from the unnamed ditch adjacent to the west boundary of NSL indicate the presence of contaminants which may have been released from NSL. If these contaminants are from NSL, they would have entered the ditch via a surface water or groundwater pathway. The presence of these contaminants in the ditch may be another indication of leachate migrating to the groundwater or surface water from the landfill.

In the NSL FS (pages 2-3), it is stated that it is not possible to estimate future releases of contaminants from the landfill, and that it is possible that if contaminant types or levels increase, the time period before which concentrations permanently decrease to nonhazardous levels may be 100 years or longer. These statements were not meant to imply that contaminant types or levels in the groundwater will increase. It is true that the nature and extent of contaminant sources within the landfill are not completely known, nor have specific mechanisms been identified for future contaminant releases. It is for these reasons that increases in types or concentrations of contaminants have been presented as possibilities. Similarly, the time period of 100 years is only presented as a possibility and not as a projection.

Many data collected over an extended period of time are needed to determine if contaminant releases from a landfill are increasing or decreasing. These type of data were not available for the NSL RI. Since NSL remains an active site, the possibilities for continued leachate generation and increasing contaminant concentrations remain.

Comment. The former cooling pond at ECC has been dredged and the contaminated soil and sludge has been removed from the pond. Therefore, the cooling pond is no longer a source of contamination. The effects of its removal on contaminant

migration were not evaluated. The CAA report states that any contaminated soil or sludge remaining in the cooling pond would have to be excavated. The need for this action is not technically justified, and is an apparent discrepancy with statements that contaminants have been removed from the pond (ECC Steering Committee; TRW, Inc.; Tricil).

U.S. EPA Response. It was reported in June 1985, in the on-scene coordinator report for the immediate removal of ECC by Roy F. Weston, Inc., that the partially dredged pond was backfilled with contaminated soil excavated from around the process building and tank areas. Therefore, the cooling pond remains a potential source of groundwater contamination. The CAA report recommends that the pond area be investigated to determine if it is contaminated, and to remove the contamination if necessary.

Comment. It is possible to distinguish between contaminants from ECC at NSL both in terms of onsite and offsite contamination. The volumes of groundwater, levels and types of contaminants from ECC and NSL are different. A greater proportion of organic contamination is from the ECC site (ECC Steering Committee; NSL, Inc.).

U.S. EPA Response. It is to be expected, based on what is known about the contaminant sources at ECC and NSL, that organics will constitute a relatively greater portion of the contaminants from ECC than from NSL. However, it is not unreasonable to expect organic contamination to be released from NSL. Most of the landfill volume consists of refuse and municipal waste, which has been observed to release organic contaminants to the environment at this and other landfills. There is also some additional volume of hazardous substances within NSL, including the former oil separation lagoon.

While differences in concentrations and types of organic and inorganic contaminants from ECC and NSL may be distinguishable for portions of the sites, total contaminant mass contributions from each site cannot be compared. Estimates of total groundwater discharge from each site are needed to calculate contaminant mass contributions, and estimates of total groundwater discharge were not generated as part of the RI's or FS's.

Based on the geology and hydrogeology of the NSL and ECC sites, it is expected that groundwater contaminants detected within the ECC site and adjacent to the south and west boundaries of the site are from ECC. Similarly, it is expected that groundwater contaminants detected along the south boundary and at the southwest corner of the landfill are from NSL. It is more difficult to distinguish the source of groundwater contaminants found along the unnamed ditch, or of surface

water contaminants found in unnamed ditch and in Finley Creek downstream of its confluence with the ditch.

Comment. The shallow saturated zone (till) beneath ECC is not an aquifer, nor is the underlying sand and gravel lens. The glacial till unit beneath NSL does not constitute an aquifer. It is not reasonable to expect that drinking water wells would be completed in these formations, nor between the sites and the groundwater discharge areas. The justification for considering these units as aquifers is not presented (ECC Steering Committee; NSL Steering Committee; TRW, Inc.; Tricil).

U.S. EPA Response. The publication entitled "Water Resources of Boone County with Emphasis on Groundwater Availability (W.J. Steen, et al., Department of Natural Resources, State of Indiana, Division of Water, 1977) describes the area of ECC and NSL as one in which well yields from 5 to 150 gpm can be developed. It states that well supplies are predominantly obtained from sand and gravel aquifers within the glacial drift at depths ranging from 30 to over 300 feet. The intertill sand and gravel aquifers are extensively used.

It is unlikely that the glacial till beneath NSL or the shallow saturated zone beneath ECC would be used for drinking water due to their low transmissivities and recharge potential. An estimate of well yield for the sand and gravel lens beneath ECC is given in comments prepared by the ECC Steering Committee. They estimate a potential yield of 1 gpm (1,440 gpd) at a drawdown of approximately 2 feet below the static groundwater level. This would be sufficient yield for a domestic water supply well.

Comment. The extent of groundwater contaminants in the shallow saturated zone (till) beneath ECC cannot be established based on the one valid groundwater sample from that zone (ECC Steering Committee).

U.S. EPA Response. It is true that only one or two groundwater monitoring points existed in the shallow saturated zone. However, contamination of the shallow saturated zone at ECC was assessed using data from the monitoring wells, and also from groundwater concentrations predicted using results from analyses of soil samples collected from the zone. Details of the prediction methods are presented in Chapter 5 and Appendix C of the ECC RI, and in Appendix A of the ECC FS.

Comment. To estimate travel times of contaminants, a distance from monitoring wells to the surface waters was arbitrarily chosen as 50 feet. If the distances between the wells and surface waters were increased, travel times may be

long enough to allow implementation of remedial actions after monitoring (NSL Steering Committee).

U.S. EPA Response. The distance between the landfill perimeter and Finley Creek varies from approximately 10 to 200 feet, based on maps presented in the reports. Therefore, a contaminant travel distance of 50 feet to the creek is a presently existing condition of the site. Contaminant travel times would be increased if monitoring wells were further than 50 feet from the creek. Increased separations between monitoring wells and surface water could be achieved by moving the creek and/or the landfill perimeter. However, the comments do not establish that, even with increased separation, there will be adequate time to react to increasing contaminant levels in monitoring wells.

Comment. The possible reduction in leachate generation at NSL is inadequate justification for a RCRA cap. A reduction in the quantity of leachate to be collected and treated would not necessarily make an alternative with a RCRA cap more reliable (Tricil; Ferro Corp.).

U.S. EPA Response. Placing a RCRA cap on the landfill would decrease the rate of leachate generation, as compared to the site with a soil cover, by the mere fact of reducing the amount of percolation through the landfill surface.

In the CAA report (page 2-15) it is stated that operation and maintenance of the treatment system in Alternative 5 (including a RCRA cap) will be less than with Alternative 4 (without a RCRA cap) because of the lower flowrate resulting from decreased leachate generation.

If an alternative including a RCRA cap is more reliable than one without a RCRA cap, it is because a properly maintained RCRA cap will be effective in almost eliminating leachate generation, which will reduce the loading of contaminants to the groundwater and ultimately to the collection and treatment system. In the CAA report, any comparisons of reliability between Alternatives 4 and 5 on this basis were made assuming that Alternative 4 included a soil cover that prevented direct contact with the landfill surface, but did not necessarily reduce the rate of leachate generation.

Comment. The proposed groundwater monitoring system is unnecessarily complex considering the low levels of contamination that occur today. No additional wells are needed; the existing wells should be sufficient. The monitoring program needs careful review (NSL, Inc.; Tricil).

U.S. EPA Response. The proposed groundwater monitoring program for Alternative 5 in the CAA report is to assure that the alternative is functioning properly and not necessarily

to monitor trends in contaminant levels at the site. Therefore, the monitoring program was designed on the basis of the anticipated response of the groundwater system to the alternative and not on the basis of presently observed contaminant levels.

The conceptual design of the monitoring program will be reviewed and revised as necessary during design efforts at the site. It will also be possible to modify the monitoring program pending the outcome of the preliminary monitoring results. Modifications may involve either upgrading or downsizing the magnitude of the proposed monitoring program.

Comment. The CAA report incorrectly concludes that insufficient time for implementation of remedial actions is available if major increases of contamination show up in the southwest corner of the landfill. Existing wells could be pumped if contaminant levels increase, and additional wells could be drilled on short notice if needed (NSL, Inc.).

U.S. EPA Response. The comments provided no analyses of a groundwater pumping system incorporating existing wells. Therefore, this use of existing wells cannot be evaluated. Pumping of existing wells to extract contaminated groundwater is believed to be technically infeasible since these wells were installed as monitoring wells for sampling purposes and were not designed for long-term pumping use.

Comment. The sand lens beneath the ECC site and the sand and gravel zone along the unnamed ditch are distinctly different units. The sand and gravel zone in the unnamed ditch area begins at the ground surface and has a surface layer of topsoil. It is not overlain by glacial till as is the sand lens beneath ECC. The two sand units do intersect each other (NSL, Inc.).

U.S. EPA Response. Geologic cross sections in the NSL FS (Figures 1-12 and 1-13) show that deposits of sand and gravel do extend from Finley Creek and unnamed ditch to the southwest corner of the NSL site and ECC. The sand deposits are shown as having different lithologies, which may be due to differences in origin (deposited immediately after glaciation versus recently as a result of stream action). However, the fact that the sand units intersect each other supports the interpretation in the CAA report that the sand and gravel lens beneath the ECC site and the southwest corner of the NSL site forms a pathway for contaminated groundwater to discharge directly to the creek.

Comment. A groundwater interception rate of 60 gpm from beneath NSL is too high. This is equivalent to a 73 percent infiltration of precipitation over the 70 acre landfill area (NSL, Inc.).

U.S. EPA Response. Estimates of groundwater collection rates are presented in Appendix B of the NSL FS. The estimated rate of groundwater collection takes into consideration the need to lower the water table at the collection system to an elevation below that of Finley Creek. By doing this, the collection system rather than the creek will constitute the area of groundwater discharge.

The comment assumes that the recharge area for groundwater flow beneath NSL is limited to the area of the landfill. The recharge area for this subregional groundwater flow system may exceed the 70 acre landfill, in which case the equivalent infiltration would be less than 73 percent of precipitation.

An estimated groundwater collection rate of 60 gpm was used for Alternative 5 in the CAA report. This included the estimates of flow to a groundwater collection system along the south boundary of NSL, and of flow to a collection system south and southwest of the ECC site in the area of the relatively large sand and gravel lens. The estimated flow to a subsurface drain along the south boundary of the NSL site was 23 gpm (NSL FS, Appendix B, page B-11).

Comment. Calculations or references supporting the estimate of leachate production at NSL are not provided. The estimates are too high for a landfill covered with a silty clay till soil. A rate of 40 gpm is excessive for annual precipitation of 38 inches on a landfill covered with clay and having a sloping land surface. Based on collection rates in the existing leachate collection system, a high estimate for leachate generation would be 1 gpm (NSL Steering Committee; NSL, Inc.).

U.S. EPA Response. Estimates of leachate generation are presented in Appendix B of the NSL FS. A percolation rate of 10 in/year was used for a soil cover on the landfill surface. This does not represent an estimate of actual percolation based on soil conditions, soil moisture balance modeling, or records of leachate collection. It was assumed that the purpose of the soil cover was to prevent direct contact with the landfill surface and not to reduce percolation. Therefore, it was not assumed that the cover would necessarily consist of silty clay till soil. If the soil cover did consist of compacted silty clay till of sufficient thickness, it is reasonable to expect that percolation would be less than 10 in/year. It would also be reasonable to assume that the percolation rate would be no larger than that rate which is occurring now, if it could be adequately determined.

A percolation rate of 1.5 in/year was used for a RCRA cap on the landfill surface. This does not represent an estimate

of actual percolation based on moisture balance modeling or evaluations of RCRA cap performance.

Comment. In 1982, the only well determined to be polluted at NSL was MW1 located near the southwest corner of the landfill. By 1983, the southwest corner of the landfill had been removed and emergency response actions had been undertaken at ECC. Concentrations of both total organics and chlorinated organics have decreased in MW1 since 1983, and these reductions have, for the most part, been sustained. Because refuse is no longer in contact with the sand deposit at the southwest corner of MW1, the chloride concentration in MW1 will continue to decrease with time (NSL, Inc.).

U.S. EPA Response. The apparent reduction in concentrations of organic and inorganic contaminants in MW1 may be due to the removal of the local source. The refuse (source) was dug up and reburied in the landfill further away from MW1. The trends presented in the comments for organic and inorganic parameters in MW1 are conflicting, in that inorganic concentrations increase as organic concentrations decrease. It is possible that the data are insufficient to establish trends that could be used to predict future concentrations at MW1.

MW1 may have been the only polluted well in 1982, but other polluted wells were identified during the subsequent RI's. The period of time over which MW1 has been monitored is short relative to the age of the landfill, and any trends of decreasing concentration which may be established using data from MW1 would be characteristic of the southwest corner of the landfill and not necessarily of the entire landfill boundary.

Comment. Contaminants in Finley Creek are from a source other than ECC or NSL (ECC Steering Committee; Mersman).

U.S. EPA Response. Information and field data collected subsequent to the ECC and NSL remedial investigations indicate that sources of contamination may exist in areas which were not specifically investigated during the RI's. If these sources do in fact exist, they would contribute to the contamination observed in Finley Creek downstream of ECC and NSL. However, sampling of Finley Creek, the unnamed ditch, and monitoring wells adjacent to the creek and ditch indicate that contaminants in the creek and ditch are being contributed by ECC and/or NSL.

Comment. The geology of the NSL site presented in the remedial investigation report was reinterpreted in the feasibility study. The reinterpreted geology, which included the identification of discontinuous lenses of sand

and gravel within the till beneath the landfill, makes migration of groundwater contaminants from NSL less likely (NSL, Inc.).

U.S. EPA Response. The geological interpretations presented in the NSL RI were refined to include subsurface geological information which became available during preparation of the NSL FS. The revised interpretation of the site geology indicates lenses of water-bearing sand and gravel within the glacial till beneath the landfill. These lenses may occur at or near the original ground surface beneath the refuse, and may act as conduits for movement of groundwater and contaminants from beneath the landfill. The west boundary of the landfill is above or near a relatively large lens of sand and gravel which extends to the area occupied by Finley Creek and the unnamed ditch.

Comment. The method selected for calculating groundwater contamination from NSL yields unrealistically high results (as presented in column 2 of Table 2-4 in the CAA report). The values for noncontaminated samples are discarded and do not reduce the average as they should (NSL, Inc.).

U.S. EPA Response. The average concentrations presented in the tables are averages of the samples in which the contaminants were detected, and do not account for the samples in which the contaminants were not detected. The average of detected contaminants were presented for conceptual treatment plant sizing and costing purposes and not to completely characterize groundwater contamination from NSL.

Comment. The groundwater moving away from the landfill proper should never be of poorer quality than leachate [sic]. Minimal contamination was found in leachate liquids. It is impossible for organic contaminant levels to increase in the groundwater adjacent to the landfill without inputs from ECC (NSL, Inc.; Tricil).

U.S. EPA Response. It is true that, on a mass balance basis, groundwater contaminated with leachate should have lower concentrations than the leachate due to its dilution in groundwater. The dilution ratio will depend on the ratio of leachate generation to groundwater underflow. No leachate springs or seeps were sampled during the RI's, but samples were taken from the onsite leachate tanks, and from ditches adjacent to the north and east sides of the landfill. It is reasonable to expect that leachate coming out of the north and east sides of the landfill could enter the ditches.

Samples from the leachate tanks and ditches were found to be contaminated. Summaries of the detected contaminants are presented on pages 1-13 and 1-14 of the NSL FS.

Comment. Data are not presented to support the interpretation that groundwater discharges to Finley Creek and the unnamed ditch (NSL, Inc.; TRW, Inc.).

U.S. EPA Response. Interpretations of the site hydrogeology are presented on pages 1-9 to 1-11 in the NSL FS. Groundwater levels in wells adjacent to Finley Creek and the unnamed ditch were higher than the elevation of the adjacent surface water, indicating an upward hydraulic gradient. Flow occurs in the creek and ditch during times of no-rainfall, which indicates some degree of base flow groundwater discharge. Seeps have also been observed along the banks of the creek and ditch during periods of low flow. These data have been interpreted to indicate that groundwater at the shallow and intermediate depths investigated by the RI monitoring wells discharges to the surface water.

Comment. No information was presented to support the contention that the impermeable membrane to be installed in the subsurface drain of CAA Alternative 5 is technically feasible. CAA Alternative 4 is more likely to be technically feasible since it substitutes wells for the subsurface drain (Jeffboat).

U.S. EPA Response. Installation of the impermeable membrane is considered to be technically feasible. Details of the impermeable membrane proposed for the section of subsurface drain south of ECC and southwest of NSL are presented on page 2-15 of the CAA report. The membrane would be constructed in place as the drain trench was backfilled. Synthetic membrane would be placed along the trench wall, and the clay barrier would be constructed in layers by hand, or by the placement of premanufactured clay panels. Estimated costs for construction of the membrane are presented in Appendix A of the CAA report.

Comment. The quantity of dewatering for CAA Alternative 4, which includes wells in the sand and gravel unit south of ECC and southwest of NSL, will be less than for CAA Alternative 5, which includes a subsurface drain in this area (Jeffboat).

U.S. EPA Response. It is true that the subsurface drain will require more construction dewatering than the installation of wells. The drain could, however, result in lower long-term pumping rates because of the opportunity to install an impermeable membrane on the downgradient side of the trench, and thereby minimize inflow from surface water. The drain will also allow the groundwater interception system to be converted to a groundwater isolation system, as in CAA Alternative 6. The advantages of this flexibility are discussed in Chapter 2 of the CAA report.

Comment. In the CAA Alternative 5 groundwater collection system, water will be pumped from a drain at a depth of 5 feet below the existing water table. This will not eliminate the possibility of contaminated groundwater moving under the drain and offsite. The design depth of the pipe should be carefully reviewed (Jeffboat; NSL, Inc.).

U.S. EPA Response. The subsurface drain in the groundwater collection system will be designed to lower the water level to the point that contaminated groundwater flow into the drain and not to the adjacent surface water. Hydrologic analyses conducted for the FS's indicate that lowering the water table 5 feet may be sufficient to achieve this goal. Groundwater may go beneath the drain, but based on the results of the RI's, this groundwater is not expected to be contaminated. Detailed calculations of drain geometry are presented in Appendix B of the NSL FS. The actual depth at which the drain will be installed will be determined as part of the design process for the alternative.

Comment. A significant potential for dewatering problems most likely would occur during construction of the groundwater collection system. Sloughing of sandy materials in the southwest area of NSL and south of ECC could present significant problems. No provisions were made for managing the quantities of dewatering (Jeffboat).

U.S. EPA Response. Dewatering would be required during construction of the subsurface drain, as would slope stability of the trench walls. Construction dewatering would have to be handled and treated at either an onsite or offsite facility. Costs for excavation, shoring and bracing, and dewatering were developed for alternatives in both the NSL FS and CAA reports. Refer to Tables D-9 and D-13 in Appendix D of the NSL FS, and to tables A-9 and A-13 in the CAA report. No specific costs were developed for handling and treatment of construction dewatering.

Design of lateral support systems for subsurface drains or construction dewatering systems are not done as part of a feasibility study. Therefore, costs presented for these systems in the FS and CAA reports are estimates only. Estimates of construction dewatering will be developed as part of the design process for the alternative.

Comment. A perimeter slurry wall should be proposed around NSL so that the corrective action will be consistent with requirements as determined in cause N-95 by the Indiana Solid Waste Management Board on January 21, 1987. The slurry wall should not be rejected unless it can be clearly shown that it will be ineffective. The use of a slurry wall should have been seriously considered by the FS and CAA reports. The assertion that the impermeable liner in the

CAA Alternative 5 groundwater collection system would minimize inflow from Finley Creek is inconsistent with the reluctance to accept a slurry wall. The sand and gravel unit in the southwestern area of the landfill extends to a depth of approximately 30 feet, and a slurry wall could be placed to this depth in that area. The likelihood of groundwater movement across a slurry wall would be extremely remote (Rock Island Refining; Jeffboat; Chrysler).

U.S. EPA Response. The use of a slurry wall at NSL was proposed on the basis of the site geology presented in the NSL RI. In this report, the site geology was described as including a layer of sand underlain by glacial till. The purpose of a slurry wall would have been to block the flow of groundwater in the sand unit to prevent it from discharging to surface waters. This would have been achieved by placing the wall through the sand unit and into the top of the underlying glacial till. It is true that there would be little groundwater movement through a slurry wall, so that regional groundwater flow moving toward the surface water discharge areas would tend to pile up behind the slurry wall. Some pumping of the upgradient side of the slurry wall would have been required to prevent the groundwater from overtopping or flowing around the ends of the slurry wall.

The interpretation of the NSL site geology was refined in the NSL FS. In this report, the site geology was described as including discontinuous lenses of sand and gravel within the glacial till beneath the site. The degree of hydraulic interconnection between lenses at different locations and different elevations is not known. There is no identifiable impermeable soil unit beneath all of the lenses into which the bottom of a slurry wall can be placed, and the possibility remains for groundwater from beneath the landfill to move beneath a slurry wall through a series of interconnected lenses.

The impermeable liner in the CAA Alternative 5 groundwater collection system is not intended to prevent groundwater discharge to surface water in the absence of the subsurface drain. Pumping of water levels in the drain to an elevation below that of the creek will cause groundwater in the upper portion of the water bearing unit to discharge to the drain rather than the creek. The purpose of the impermeable barrier on the downgradient side of the drain trench is simply to minimize inflow from the creek. It is anticipated that some surface water will move beneath the barrier and into the subsurface drain.

Alternative 5 in the CAA report includes an impermeable barrier on the downgradient side of the subsurface drain trench in the area of the relatively large sand and gravel

lens southwest of the landfill and south of ECC. This barrier will extend into the glacial till beneath the sand lens, and for this reason will essentially act as a slurry wall. The need for groundwater pumping on the upgradient side of the barrier to prevent groundwater from overtopping or moving around the barrier will be achieved as the subsurface drain is operated to collect contaminated groundwater.

Comment. A cap on NSL consisting of compacted glacial till soils which surround (and underlie) the site would meet RCRA cap requirements with respect to percolation of incident precipitation. A compacted till cap would substantially reduce the quantity of leachate generation, and there would be no significant degree of difference in the potential for the migration of contaminants to groundwater between this cap and a soil-synthetic membrane-clay cap. The failure to consider glacial till as a capping material is a major omission in the analyses (NSL Steering Committee; Tricil).

U.S. EPA Response. The soil cap proposed in the reports was intended to prevent contact with surface soils, and not necessarily to reduce percolation rates. It is true that a cap of compacted native glacial till could significantly reduce percolation through the landfill and thereby reduce generation of leachate. Local soils would have to be investigated to determine if they are adequate for use as a cap. It would take some time for the reduction in percolation to manifest itself as reduced leachate generation; in the reports this was assumed to be 5 years.

Percolation through a soil-synthetic membrane-clay (S-SM-C) cap would be less than through a compacted till cap, if the synthetic membrane was properly installed and remained intact. While percolation rates through both types of caps may be small, the rate through a compacted till cap may still be twice or more of that through a S-SM-C cap. This would result in twice or more as much leachate to collect and treat. However, it is reasonable to expect that the difference in percolation through a S-SM-C cap and a properly designed and installed compacted till cap would be small with respect to estimated total groundwater flowrates to the proposed groundwater collection system.

Comment. The principal reference for alternatives in the CAA report was the NSL FS. The discussions in the CAA report on groundwater collection, cap technology, and groundwater treatment differ significantly from those presented in the ECC FS (ECC Steering Committee).

U.S. EPA Response. Many aspects of the alternatives presented in the CAA report are similar to those in the NSL FS. The 6-acre ECC site is small compared to the 70-acre

NSL site, so that when the sites are combined, as they were for the CAA report, remedial actions addressing the NSL site dominate those for the ECC site. For example, only small modifications would have to be made to a groundwater collection system around NSL to include the ECC site. Certain technologies proposed in the ECC FS were not presented in the CAA report because while applicable to ECC, they are not reasonable to apply to the combined sites. An example is removal of contamination in the near surface soils at ECC, which could continue to be a source of groundwater contamination. This technology was not presented in the CAA report. If it had been, similar types of source removals would had to have been proposed for NSL. These could have included removal of residues from the former oil pond.

Comment. Groundwater extraction wells are not appropriate for consideration to remove contaminated groundwater from the sand and gravel aquifer beneath ECC (ECC Steering Committee).

U.S. EPA Response. A subsurface drain rather than wells is included in the proposed CAA Alternative 5. The purpose of groundwater collection from the sand and gravel unit beneath ECC is to prevent migration of contaminated groundwater to surface water. Groundwater in the unit was found during the remedial investigations to be contaminated, and based on observed groundwater levels it is expected that the groundwater discharges to the unnamed ditch and/or Finley Creek. Contaminated sludge and soil was removed from the ECC cooling pond during initial remedial actions, but the on scene coordinators report for that activity (by Roy F. Weston, Inc., June 1985) states that the pond was backfilled with contaminated soil from the ECC site. The pond may, therefore, continue to be a source of contamination for the sand and gravel unit.

Comment. Assumptions of no dilution of groundwater as it enters Finley Creek is very conservative. Neglected is the fact that when the creek is under low flow conditions and groundwater contributions stop, it is likely that leachate flow would also stop. No calculations are given to support the factors given on page 6-48 of the NSL RI for dilution of volatile organic compounds in groundwater after discharge to surface water (NSL, Inc.; Tricil).

U.S. EPA Response. It is true that, as flow in the creek decreases as a result of decreasing groundwater discharge, the discharge to the creek of contaminants in groundwater will also decrease. However, it is not unreasonable to anticipate that the rate of leachate generation would remain relatively constant since it is a result of average long-term percolation of water through the landfill surface.

Therefore, under these conditions it would be expected that leachate would constitute a greater proportion of discharge to the creek than under high flow conditions.

Dilution factors presented on page 6-48 of the NSL RI are based on the discussions of groundwater and surface water flow on pages 5-11 through 5-13 of the NSL RI.

Comment. The degree of accuracy of hydraulic conductivity estimates made from grain size analyses of the sand unit beneath ECC is not given. No data are available to indicate that the hydraulic conductivity is as high as 10^{-2} cm/sec, nor to indicate that the unit is homogenous and isotropic in this regard. Estimates of 10^{-3} to 10^{-4} cm/sec were made for the sands beneath NSL (Tricil).

U.S. EPA Response. A range of 10^{-2} to 10^{-3} cm/sec was given for the hydraulic conductivity of the sand and gravel unit beneath ECC (ECC RI, page 4-42). Grain size distributions of soil samples collected at ECC are presented in Appendix D of the Technical Memorandum for Subtask 3-1, all in Appendix A of the ECC RI.

Hydraulic conductivities at NSL were estimated from slug tests in monitoring wells. Results of these tests are presented in Table B-1 of NSL FS Appendix B. The test zones yielding estimated values of 10^{-3} to 10^{-4} cm/sec usually included units of clay or silt till, silty fine sand, or fill along with clean sand and gravel. The grain size analyses used to estimate hydraulic conductivity of the sand beneath ECC were of samples consisting of clean sand without lenses of finer grained soils.

Comment. Minor upgrading of the existing glacial till cap at NSL would result in a cap with an effectiveness, relative to percolation, equal to that of a so called RCRA cap (Tricil).

U.S. EPA Response. It is true that a cap of compacted glacial till could significantly reduce percolation through the landfill surface. Percolation through a RCRA cap would be less than through a compacted till cap, if the synthetic membrane in the RCRA cap was properly installed and remained intact, but it is reasonable to expect that the difference in the percolation rates would be small. The degree to which the existing glacial till "cap" on the landfill would have to be upgraded to be as effective as a RCRA cap was unknown at the time of the FS's, and remains unknown.

Comment. The rates of groundwater movement beneath NSL have never been determined. Rates presented in the reports appear to be high. Calculations are not presented in the reports (TRW, Inc.; Tricil).

U.S. EPA Response. Rate of groundwater movement beneath the NSL site is discussed on pages B-20 and B-21 of Appendix B of the NSL FS. Difficulties of estimating movement rates beneath NSL are discussed therein. Estimates of groundwater velocities beneath NSL were generated, but were not presented in the report because of the difficulties involved in making such estimates. These estimates were provided to interested parties who made a FOIA request.

Comment. No estimate is given of the volume of contaminated sediment [sic] which remains at the ECC site. Therefore, potential future harm cannot be adequately addressed (TRW, Inc.).

U.S. EPA Response. On page A-1 of Appendix A of the ECC FS, it is stated that "an estimated 11,500 cubic yards of soil with contaminant concentrations having a calculated excess lifetime risk of 10^{-6} or greater for residents ingesting soil" would need to be excavated from ECC. Estimates of volumetric weighted average soil concentrations used in the analysis of groundwater leachate interactions at ECC are presented on page 1 of Attachment 2 of Appendix A of the ECC FS.

Comment. Migration of contaminants to the nearest residential wells was not indicated by the RI data. Therefore, residential wells are not threatened by ECC (TRW, Inc.).

U.S. EPA Response. The deep confined aquifer below the ECC site was not found to be contaminated during the RI, and future migration of contaminants to this aquifer is highly unlikely due to the upward vertical hydraulic gradient. Therefore, it was not unexpected that residential walls completed in the deep confined aquifer were not contaminated. It is expected that migration of contaminants in groundwater will be limited to shallow sand and gravel units (ECC RI, page 5-5).

Comment. No estimate is given for the volume of groundwater discharging to surface water from ECC, nor as to whether the effects of the clay surface on groundwater discharge was considered (Tricil).

U.S. EPA Response. Details of groundwater discharge estimates from ECC are presented in Chapter 5 and Appendix C of the ECC RI, and in Appendix A of the ECC FS. It is stated on page 2 of Attachment 2 of Appendix A in the ECC FS that estimations of recharge at ECC were made assuming that no cap was present.

Comment. The clay soils placed on the ECC site during the initial remedial actions will discourage leaching of soil

contaminants and migration to groundwater. The effect of the clay layer on the leaching of soil contaminants to groundwater was not considered by the RI's or FS's, nor was it taken into account in the estimates of groundwater and surface water concentrations resulting from leaching. In Appendix A of the ECC, it is assumed that no cap exists on the ECC site and that the recharge rate is 7.8 in/yr. A more reasonable rate of recharge through the clay soils would be 0.1 in/yr (TRW, Inc.; Tricil).

U.S. EPA Response. It is true that clay soils were placed over the ECC site as part of the initial remedial action, but how well this material would act as a "cap" has never been evaluated and is therefore unknown. For this reason, soil contaminant leaching at ECC was evaluated as if the clay soils did not exist.

If the clay soils do act to some degree as a "cap," the recharge of 7.8 in/year could be unreasonably high. But 0.1 in/year seems unreasonably low for any kind of clay soils which could be present on the ECC surface. If the hydraulic conductivity of any clay soils on the ECC site were in the range of 10^{-6} to 10^{-7} cm/sec, then recharge would range from as much as 12 to 1.2 in/year, depending on the degree of saturation of the surface soils.

Comment. It is impossible to evaluate the accuracy of the contaminant transport and fate calculations without details of the model used. The factors applied to conclude that there were certain mobilities and persistence of contaminants need to be clarified. The wide range of variations of transport and fate properties of indicator chemicals make assessments of future conditions to appear as no more than a guess (TRW, Inc.; Tricil).

U.S. EPA Response. Contaminant fate and migration at NSL is discussed in Chapter 5 of the NSL RI, and summaries of environmental behavior of indicator organic compounds and metals are presented in Table 5-3 and 5-4, respectively. Environmental profiles of contaminants at NSL are presented in Appendix B of the NSL FS. Similarly, contaminant fate and migration at ECC is discussed in Chapter 5 of the ECC RI, environmental behavior of indicator chemicals are summarized in Table 5-4, and discussions of contaminant transport and fate are presented in Appendix C.

The ranges of travel times for contaminants at ECC, shown on page 5-13 of the ECC RI, are due to ranges in values for soil properties, hydraulic conductivities, and travel distances. Details of these travel time calculations are presented in Chapter 5 and Appendix C of the ECC RI.

Comment. Values of hydraulic conductivity for ECC would be erroneously high, as would estimated rates of groundwater movement, if corrections in the analyses were not made to account for the sand pack around the monitoring well screens (Tricil).

U.S. EPA Response. Estimates of hydraulic conductivity for ECC were made from grain size analyses and not from well tests. Therefore, corrections for the sand packs were not needed.

Comment. It is not clear in CAA Alternative 4 if the flow of 140 gpm is from ECC alone or from ECC and NSL combined. A combined flow of 140 gpm would not be needed [sic] if soil contaminants at ECC, which would leach to groundwater, were removed and treated (Mersman).

U.S. EPA Response. The estimated flows for CAA Alternative 4 are broken down on page 2-13 of the CAA report. The ECC underdrain would contribute an estimated 8 gpm, the subsurface drain around NSL would contribute 25 gpm, and the six extraction wells south of ECC and southwest of NSL would contribute 65 gpm. The leachate collection system around NSL would contribute 40 gpm.

The ECC underdrains in Alternative 4 could be eliminated if soil contaminants were removed. If, however, the ECC underdrains were eliminated, the flow to the subsurface drains, extraction wells, and leachate collection system would be reduced by only 8 gpm. Page C-1 of appendix C of the CAA report states that the groundwater collection system for CAA Alternative 4 would be similar to that for Alternative 4 in the NSL FS, as would the flowrates.

Comment. The contamination in the shallow sand and gravel below ECC has not been fully attributed to any hazardous waste disposal at the surface level. Contamination was from the cooling pond. The evidence with regards to any contaminants at the ECC site below a mere shallow contaminated zone is not at this time attributable to any contaminants in that shallow zone [sic] (Mersman).

U.S. EPA Response. On page 4-59 of the ECC RI, it is stated that contamination of the shallow sand and gravel unit beneath ECC may have occurred either via migration through the silty clay till onsite or through contaminated water and sediment in the former cooling water pond, which intersected the shallow sand and gravel unit.

It is true that hydraulic gradients from the unit are now vertically upward, so that downward migration of surface contaminants would not be expected in the future. But it is not known if past activities at ECC could in fact have

caused a reversal of this gradient and allowed downward migration of contaminants.

Comment. No information is given regarding the drilling contamination problems at ECC well 4A. It is questionable if drilling contamination could have occurred at other wells (Tricil).

U.S. EPA Response. The drilling of ECC well 4A is discussed on page 4 of the Hydrogeologic Study Technical Memorandum in Appendix A of the ECC RI. Drilling problems similar to those at well 4A would have been described if they had occurred.

Comment. There is no evidence presented to confirm the suggestion in the NSL RI that the water table within the landfill is mounded (Tricil).

U.S. EPA Response. Interpretations of mounding within the landfill were modified for the NSL FS. On page 1-11 of the NSL FS, it is stated that the groundwater in the glacial till beneath the landfill may be mounded, but that there could only be localized contact between groundwater and the landfill refuse. Detailed discussions of mounding are in Appendix B of the NSL FS.

Comment. The benefit of a leachate collection system more than 1 mile in length cannot be considered to be cost-effective for the collection of the 5 gpm of leachate expected to be produced after NSL is capped (Tricil).

U.S. EPA Response. A leachate generation rate of 5 gpm is equivalent to approximately 7,000 gallons of leachate generation per day, and 2,600,000 gallons over the course of a year. If this leachate is not collected, it will enter groundwater or surface water adjacent to the site.

Comment. There is no evidence that the sand and gravel unit beneath ECC is a discrete water bearing unit and does not in fact occur as discontinuous lenses [sic] (Tricil).

U.S. EPA Response. Geologic cross sections through the ECC site are shown in Figures 1-12 and 1-13 in the NSL FS. The continuity of the sand and gravel unit was interpreted on the basis of the thickness of the unit encountered in the test borings, and the relative locations of the borings in which the unit was encountered. On page 1-4 of the CAA report, it is stated that because the thickness and continuity of the lens beneath ECC is greater than other sand and gravel lenses encountered in the test borings, this lens has been considered as a discrete unit within the glacial till.

Comment. The effect of temperature, soil organic content, and oxidation reduction potential on reducing contaminant levels at NSL were not assessed (Tricil).

U.S. EPA Response. The specific contents of the landfill are unknown. Much information exists on generation and migration of leachate (for example, in J.C.S. Lu, et al., Leachate from Municipal Landfills, Noyes Publications, 1985), but it would be difficult to quantify the effects of physical-chemical features of the site on generation and migration of leachate without a more thorough knowledge of the nature and extent of municipal and hazardous wastes within the landfill.

Comment. The increase in contaminant concentrations at NSL (if it ever occurs) is expected to be very gradual. A monitoring system could be carefully developed to measure groundwater quality close to the landfill which would detect any significant increase in contaminants, should that occur. The concern about insufficient time to implement remedial actions once previously undetected contaminants or increased levels of contaminants are detected has no basis and is highly questionable due to the slow rate of groundwater movement. A much larger span of time will be made available by observing a correlation of groundwater contaminant increase with time. An upward or downward trend would be gradual with respect to contaminant levels, and there would in fact be sufficient time for the implementation of remedial measures. An additional safety factor is provided by the low contaminant levels described in the reports. A considerable increase would, therefore, be necessary for an increase in risk. If levels of contamination are found through monitoring to be rising, the additional action could be implemented (NSL Steering Committee; NSL, Inc.; Tricil; Chrysler; Ferro Corp.).

U.S. EPA Response. Calculations of estimated groundwater velocities in sand and gravel lenses at NSL were provided in response to various FOIA requests. The estimated velocities ranged from approximately 0.2 to 17 feet/day. Differences in the estimates were due to variations in estimated hydraulic conductivity values, in measured hydraulic gradients, and in assumed values of effective porosity. Contaminant velocities would be less than the groundwater velocity, depending on the retardation factor of the contaminant. For some of the indicator contaminants at NSL, these factors ranged from 1.1 to 2.4.

The range of estimated velocities indicates the degree of uncertainty that would be inherent in designing a groundwater monitoring program that would allow enough time to react to increasing contaminant levels in groundwater. An adequate monitoring program would have sufficient

distance between the point of monitoring and surface water to allow enough time to react to increasing contaminant levels. At certain locations along the site perimeter, sufficient distance may only be obtainable by moving surface water courses and/or the landfill perimeter itself. It would also have to be assured that no sources of contamination exist between the line of monitoring points and the surface water. It may be technically infeasible to develop sufficient distance between monitoring points and surface water, and the cost of doing so may be high compared to the cost of implementing CAA Alternative 5. CERCLA does not permit U.S. EPA to implement an alternative which allows offsite migration of contaminants.

Comment. The conclusion that groundwater monitoring will not allow sufficient time to implement remedial action is unjustified for the ECC site. Travel times from the site to the unnamed ditch vary between 20 and 800 years, and the ECC RI states that most of the volatile compounds will degrade to below the 10^{-6} cancer risk level within 10 years (pages 5 to 11). For the foreseeable future, contaminated groundwater would have no impact on surface water, and monitoring would suffice as protection (ECC Steering Committee; TRW, Inc.).

U.S. EPA Response. A difficulty with monitoring at the ECC site is the relative proximity of the eastern boundary of the site to the unnamed ditch. Once contaminants were detected in monitoring wells adjacent to the east boundary of the site, only short travel distances would be needed to reach the ditch. While contaminant transport rates in the shallow saturated zone may be slow, they may still be fast enough to travel the distances to the ditch before remedial actions can be undertaken. A groundwater velocity of 2.6 feet/year was estimated for the shallow saturated zone (till) beneath ECC, and of 100 to 1,000 feet/year for the underlying sand and gravel unit (ECC RI, pages 5-8 to 5-11).

4.9 TECHNOLOGIES AND COSTING METHODS

Capping

Comment. EPA's recommendation to place a soil-synthetic membrane-clay cap over both ECC and NSL is unwarranted because:

- It offers no significant benefit over a soil-clay cap
- It is technically infeasible
- A simpler, less expensive cap could be used and still meet RCRA requirements

(ECC Steering Committee; NSL Steering Committee; Jeffboat; Rock Island Refining; Tricil; Jones, Inc.; Thermoset; Ferro Corp.; Mersman).

U.S. EPA Response. The selected alternative must comply with all applicable, relevant and appropriate requirements. Since ECC and NSL had interim status under RCRA, both sites must be capped with a RCRA compliant cap. (Please refer to the Record of Decision (ROD).) The soil-synthetic membrane-clay cap meets the RCRA requirements and is technically feasible to implement. During design the cap ultimately used at the site may be refined to reduce costs. However, it would still need to meet the RCRA requirements to minimize liquid migration and maintenance, promote drainage, accommodate subsidence, and have a permeability less than or equal to any bottom liner or natural subsoils.

EPA has invited the PRP's to develop an alternate cap design that is in compliance with RCRA.

Comment. The soil-synthetic membrane-clay cap presented in the FS's and CAA would not be as effective as a glacial till cap since it is subject to ripping or cracking from differential settlement (Tricil).

U.S. EPA Response. The soil-synthetic membrane-clay cap proposed in the FS's and CAA would be more effective than a glacial till cap because it incorporates the flexibility of the membrane and the "self-healing" capabilities of clay. If differential settlement of the landfill over time was sufficient to cause ripping or cracking of the membrane, the cap would still be more effective than a glacial till cap due to the clay layer. However, the amount of differential settlement necessary to rip a membrane would typically create a noticeable disjunction at the landfill surface.

The caps presented in the FS's and CAA are conceptual and are used to present a range of cost and reliability. The final design of the cap for the site will need to consider the possibility of damage to the membrane from differential settlement and the cost and complexity of repairs.

Comment. The recommendations for a soil-synthetic membrane-clay cap on the ECC site is unwarranted since the effectiveness of the existing clay cap and concrete pad have not been evaluated (Tricil; ECC Steering Committee).

U.S. EPA Response. The integrity of the existing cap is in question because water samples taken from the ponded surface water were found to be contaminated. The contamination may have occurred from upward migration of VOC's from the underlying contaminated soils or from mixing of cover material with underlying soil. The concrete pad on the

southwestern portion of the site is not an adequate cap over the long-term because it is subject to cracking from freeze/ thaw conditions.

Comment. Placing a cap over the ECC site would be counter productive since it would eliminate volatilization which is one of the major transport routes for contaminants. If a cap were placed over the area, this route would be blocked and the only transport would be via groundwater (NSL, Inc.).

U.S. EPA Response. The intent of capping the ECC site is to eliminate direct contact with contaminants and to minimize the mobility of the contaminants by reducing infiltration and volatilization and preventing transport via surface runoff. The release of contaminants to surface water or the air could pose additional threats to public health.

Comment. What is U.S. EPA's previous experience with soil caps versus soil-synthetic membrane-clay caps and is the latter worth the extra $13 million? (NSL Steering Committee; NSL/ECC Public Hearing December 17, 1986).

U.S. EPA Response. No data is available for a side-by-side comparison of the performance of soil caps and soil-synthetic membrane-clay caps over time. A soil cap is used to eliminate direct contact with contaminated soil or debris and to enhance the growth of vegetation for erosion control and increased evapotranspiration. A soil-synthetic membrane-clay cap performs these functions and, in addition, minimizes infiltration into the landfill. The benefit is a reduction in the quantity of leachate that is migrating to the groundwater. Theoretically, this will result in cost savings by reducing the time period over which the leachate and groundwater need to be collected and treated.

Comment. The relocation of the unnamed ditch is unwarranted and inappropriate for the ECC site (ECC Steering Committee).

U.S. EPA Response. EPA considers ECC and NSL to be one site (see comments on COMBINATION OF SITES). The unnamed ditch was rerouted to the western side of the ECC site to allow placement of a continuous cap across the combined site, and to minimize the length of the collection system and groundwater monitoring system.

Cooling Pond Sludge

Comment. Removal of the soil (sludge) from the bottom of the former cooling pond is unwarranted since the pond was previously dredged and no data exists to indicate that the existing soil is contaminated. The removal of this material would provide only minimal benefit to groundwater protection (ECC Steering Committee; Tricil).

U.S. EPA Response. During removal of the contaminated sludge from the cooling pond, significant dewatering problems were encountered and all the contaminated sludge may not have been removed. As a result, the cooling pond is still a potential source of contamination. The selected alternative included further investigation of the pond contents and removal, if necessary. In response to comments and further evaluation U.S. EPA believes that even if the pond contents are contaminated, removal would provide minimal benefit since offsite migration of contaminants would be prevented by the cap and the groundwater collection and treatment system included in the recommended alternative.

Groundwater Treatment

Comments. No data were presented to substantiate that there is sufficient BOD or biodegradable COD in the leachate and groundwater to sustain a biological treatment system (NSL Steering Committee).

U.S. EPA Response. As mentioned in the NSL-FS and the CAA, the treatment system was developed with only limited data. Pilot studies and additional sampling are necessary to determine if the proposed treatment system is the most cost-effective system. The powdered activated carbon treatment (PACT) system was chosen for the purpose of cost estimating because it is a viable alternative and it offers a large degree of flexibility. The PACT system has been shown to operate effectively with influent BOD and COD concentrations as low as 50 mg/l and 100 mg/l, respectively (Zimpro Inc. Technical Bulletin). Historical data from the monitoring wells at NSL indicated a range of COD concentrations from 1 mg/l to 300 mg/l. The COD concentrations in the leachate are expected to be much higher based on typical concentrations reported in municipal landfill leachate[1]. Additional data and testing are necessary to define the characteristics of the leachate and groundwater before a treatment system can be designed.

Comment. The groundwater treatment system selected for the ECC site is inconsistent with the system selected for both sites (ECC Steering Committee).

U.S. EPA Response. The CAA states that additional sampling and pilot studies are necessary to determine the most cost-effective treatment system for the leachate and groundwater from the combined sites. The system selected in

[1] Tchobanoglous, Theisen, and Eliassen Solid Wastes. New York: McGraw-Hill, Inc., 1977. p. 332.

the ECC-FS for ECC site alone would not be appropriate for the combined sites because the leachate from NSL is expected to have a much higher BOD with a significant portion in the form of nonhazardous organic matter. Since activated carbon will not preferentially remove the hazardous organics, the organic matter will quickly saturate the carbon bed necessitating frequent replacement and resulting in high operational costs. As mentioned in the NSL-FS, the organic matter must be treated prior to activated carbon adsorption. The NSL-FS presented two treatment options--biological treatment followed by activated carbon adsorption and activated carbon enhanced biological treatment (PACT).

In addition, the NSL-FS and CAA proposed a precipitation system be added to the treatment facility for removal of metals detected in the leachate from NSL.

Comment. The concentrations of heavy metals are too low for effective removal by chemical precipitation (NSL Steering Committee).

U.S. EPA Response. The NSL-FS and CAA state that pilot and bench-scale testing are necessary to refine the treatment system. Additional sampling must be performed to better define the heavy metal concentrations in the groundwater and leachate. Pilot and bench-scale testing will then determine which system is the most cost-effective for meeting the discharge limits. The chemical precipitation was selected for cost estimating purposes and is a viable alternative.

Comment. EPA has not addressed adverse health impacts associated with the use of carbon adsorption. Contaminants will be removed from the surface or groundwater only to be released to the environment elsewhere. Carbon adsorption could even pollute the wastewaters being treated. The presence of metals and other potentially toxic materials in carbon, particularly regenerated carbon, may pollute the treated waters (Jeffboat and Rock Island Refining).

U.S. EPA Response. Activated carbon adsorption is a well established technology widely used throughout the world for treatment of drinking water as well as wastewater. The comment that carbon may actually pollute the water being treated is unsubstantiated. More specific information is necessary to better address this comment.

The system proposed in the FS's and CAA would use new or "virgin" carbon. The saturated or "spent" carbon would be incinerated or disposed of properly in a RCRA landfill.

Comment. The treatment system proposed would not be capable of treating and reducing chloride, total dissolved solids, sodium, or other similar components found in landfill leachate (Jeffboat and Rock Island Refining).

U.S. EPA Response. Although the proposed treatment system is not specifically designed for removal of these constituents, some reduction is expected to occur. The discharge limits for the conventional pollutants and hazardous substances will be established in the NPDES permit. If additional treatment processes are necessary to reduce chloride, total dissolved solids, sodium or other constituents, they will be included in the final design.

Comment. The proposed groundwater treatment system is not currently needed based on the statement in the CAA that "failure of the...treatment system is not likely to pose a risk to public health or environment over the short-term at present contaminant levels" (Chrysler).

U.S. EPA Response. At the current contaminant levels, the risk to public health or environment is based on long-term exposure. Failure of the treatment system for a short period of time would not pose additional risk. If concentrations increase, then even short-term exposure may increase the risk to public health or the environment (see comments under Endangerment Assessment for further information).

Comment. The ultra-conservative approach to various elements of design is additive yielding an unnecessarily expensive design (NSL, Inc.).

U.S. EPA Response. The combination of total flows and loadings which could occur were used for conceptual design purposes. EPA recognizes the proposed treatment system is based on conservative assumptions. Additional sampling and pilot and bench-scale testing will be performed to better define the wastewater characteristics and to develop the most cost-effective treatment system.

Comment. EPA failed to consider energy consumption in their analysis of alternatives, i.e., pumping costs for groundwater collection and use of coal for activated carbon (Jeffboat and Rock Island Refining).

U.S. EPA Response. Neither the amount of energy consumption nor the utilization of resources is of such a magnitude as to discount any of the alternatives.

Comment. EPA has not provided for the treatment of water from construction of the groundwater collection trench. Offsite transport of this waster for treatment would substantially increase the cost of (CAA) Alternative 5 (Jeffboat).

U.S. EPA Response. The quantity of water requiring storage and treatment from dewatering during construction will be

estimated during the predesign phase. The onsite treatment system will be designed and installed to handle this water.

Comment. EPA has not considered the impact on the schedule for completing the corrective action if it were required to install the wastewater treatment system for use in treating waters resulting from dewatering during the installation of the groundwater interceptions system (Jeffboat).

U.S. EPA Response. The schedule for completing the corrective action will be developed in the predesign phase. Storage and treatment of the water from dewatering will be taken into account. It is not expected to take any longer then the installation of the cap and the groundwater collection system.

POTW Treatment

Comment. The exclusion of POTW treatment based on uncertainty of operational costs and whether or not approval to discharge would be granted is arbitrary and capricious (Tricil).

U.S. EPA Response. Treatment at the Indianapolis POTW was excluded based on the following reasons:

- The City of Indianapolis may refuse to accept CERCLA wastes.
- The City of Indianapolis has required, in the past, that the discharge of wastes from a groundwater extraction site have no organic contamination above the detection limits. Subsequently, an onsite treatment system would be required.
- An increased sewer fee would be imposed based on the inorganic priority pollutants in the wastewater. This could substantially increase the operational costs.
- The 27-inch sanitary sewer at 86th Street to which the flows from the site would be discharged has historically surcharged during wet weather (rainfall of 1/2-inch or greater) and bypasses occur 50 percent of the time. Thus, if flows from the site were to be piped to the sewer system in Indianapolis, additional onsite holding capacity would be required during wet weather.

In-Stream Aeration

Comment. In-stream aeration has been arbitrarily eliminated because of "low removals of methylene chloride," (a

substance frequently acknowledged as being the result of laboratory contamination) and because "aquatic life in the unnamed ditch would experience extreme detrimental effects." Aeration could in fact be beneficial by increasing the dissolved oxygen content of the water (Tricil).

U.S. EPA Response. The concentrations of methylene chloride used for determining removal efficiencies of the in-stream aeration system were the projected future concentrations based on actual soil sample data and estimated leaching rates.

In-stream aeration was eliminated for the potential detrimental effects to public health and environment in addition to the poor methylene chloride removal efficiency. The system would have no means of controlling emissions and the volatilization of contaminants could pose a risk to public health. The detrimental effects to the aquatic environment from basin construction and turbulence of the aerators during operation outweigh any benefit from increased dissolved oxygen in the stream. The creek would also have to be reclassified (see response to stream reclassification in Section 4.6 REMEDIAL INVESTIGATION DATA).

Soil Vapor Extraction

Comment. Since the material detected in the soil on the ECC side does not represent a significant risk to offsite receptors [sic] the operation of a soil vapor extraction system would not constitute a significant or cost-effective mitigation for the site [sic]. EPA stated that most of the compounds would decay to levels below the 10^{-6} cancer risk within 10 years, and the benefits of the system for groundwater collection and treatment are minimal (ECC Steering Committee).

U.S. EPA Response. The U.S. EPA does not consider the advantages of the soil vapor extraction system to outweigh the costs. The reasons are stated on page 4-4 of the CAA:

> "Because a public health threat would remain in the event of future ECC site development and because removal of VOC's from the unsaturated zone is not expected to affect groundwater collection and treatment, the advantages of soil vapor extraction are not considered great. The expenditure of $2,000,000 in present worth for ECC soil vapor extraction for the marginal reduction in health threat is not considered cost-effective. Alternative 7 is not recommended by EPA."

Comment. Soil vapor extraction is technologically infeasible and unreliable for the reason that it is "conceptual in nature" at this time. EPA explicitly states that a pilot treatability study would have to be performed even before a design can be undertaken (Jeffboat and Rock Island Refining).

U.S. EPA Response. The statement in the ECC-FS that the soil vapor extraction system is "conceptual in nature" refers to the particular layout and sizing of the system. The technology is feasible and reliable and has been used in numerous applications similar to the one proposed for ECC. The ECC-FS states that pilot tests are necessary to further assess the feasibility for use on onsite soils and to accurately design the number of wells required, the amount of piping, and the size of the compressors. This alternative was not selected by the U.S. EPA because of its cost.

Incineration

Comment. Incineration of ECC soils is technically infeasible and unreliable because air emissions likely resulting from the incineration could present health and environmental risks equal to or greater than those risks allegedly posed by the ECC contaminated soils (Jeffboat and Rock Island Refining).

U.S. EPA Response. Incineration of the contaminated soils at ECC is technically feasible and reliable and has been used in similar situations. The design of the incinerator would include air emissions control equipment so that the emissions would be in compliance with the appropriate regulations. The process of permitting an incineration facility is very extensive and the potential for risks to public health or environment would be assessed in detail. This alternative was not selected by U.S. EPA.

Onsite RCRA Landfill

Comment. Construction of an onsite RCRA landfill is technically infeasible and unreasonable for the reasons that excavation of the waste materials could present significant health and environmental threats. Also, such a corrective action could delay significantly the time in which corrective action would be undertaken at the site, allowing the site to be uncorrected during a period when it could pose its greatest threats to the public health and environment (Jeffboat and Rock Island Refining).

U.S. EPA Response. On page 4-5 of the CAA, it states that an onsite RCRA landfill "is not considered cost-effective by EPA when the hazards induced by site excavation are

considered and...a lower cost alternative with a similar level of protection for public health and environment" is available. The reasons for discounting the onsite RCRA landfill, however, do not make it technically infeasible. This alternative was not selected by U.S. EPA.

Comment. Tables 5-6 to 5-11 of the NSL-FS show inconsistency in the use of multipliers to estimate total capital costs for each alternative (NSL Steering Committee).

U.S. EPA Response. Specific items in Tables 5-6 through 5-11 were estimated based on a percentage of the estimated construction costs. These percentages were modified for some alternatives to better reflect the level of effort. For example, the engineering design costs for Alternative 2 were estimated to be about 5 percent of the total implementation cost or $400,000. Alternative 3 would require more level of effort to design the RCRA cap and the design cost was estimated as $450,000 which is approximately 2 percent of the total implementation cost. Assuming 5 percent would have resulted in an excessive design cost of $1,000,000.

Comment. The cost estimate for the water treatment system are particularly suspect because there is no basis for assuming the limitations to be imposed upon discharges (Jeffboat and Rock Island Refining).

U.S. EPA Response. The NPDES permit for the discharge of the onsite wastewater treatment system has not been established yet. In order to prepare a cost estimate, assumptions had to be made concerning the level of treatment. Those assumptions are stated in the FS's and CAA. The costs could vary significantly if the discharge limits are substantially different than those assumed.

4.10 REMEDIAL ALTERNATIVE PREFERENCES

Comment. The Hoosier Chapter of the Sierra Club supports the EPA proposal to contain the contaminants coming out of the site.

The Citizens Environmental Council, Inc. thought that the proposal recommended by the EPA as the preferred remedy seems quite acceptable but do not favor onsite treatment of wastewater. However, they stated that most or all of their requisites are addressed by the EPA's remedies. They also hoped that site closure and the start of cleanup effort be underway as soon as possible.

Dee Fox, a private citizen, thought that the EPA's Alternative 5 is a good one and favored the EPA's plan to treat leachate and groundwater to remove contaminants rather

than the state's plan to just wall them in and urged that the job be done "as quickly and thoroughly as possible!"

Richard and Elizabeth Idler, private citizens, strongly encouraged proceeding with institution of Alternative 5 to eliminate this "environmental menace" because it covers the site, limits access and future development, minimizes leachate, intercepts and treats potentially contaminated groundwater, and provides for monitoring of the underlying aquifer.

The Toxic Action Project stated that any plan short of the one chosen by the EPA would be a disservice to the community of Zionsville. They also presented their belief that Congress, EPA, and research organizations have stated that land disposal of hazardous waste is the least desirable alternative for handling waste streams and that waste reduction should be the national policy.

U.S. EPA Response. The U.S. EPA appreciates the public's support of the Recommended Alternative and concern that remediation efforts at the site proceed as soon as possible. The U.S. EPA is presently performing Preliminary Design investigations as a prelude to design, which includes testing of treatment plant performance for removing contaminants from collected groundwater and leachate. The U.S. EPA is also continuing negotiations with Potentially Responsible Parties (PRP's) concerning U.S. EPA's selected remedy in order to assess the degree of participation anticipated from each PRP in remediation of the site.

Comment. The only appropriate alternative identified by U.S. EPA for Enviro-Chem is the ECC FS Alternative 2 (ECC Steering Committee).

The U.S. EPA identified risks that were not shown to be invalid [sic] are effectively mitigated by a modified Alternative 2 in the NSL FS which would delete the soil cover, removal of creek and leachate sediments, and rerouting of unnamed ditch and Finley Creek [sic] (NSL Steering Committee).

Based on the lack of a current health threat and absence of data on future health threats, the recommendation that installation of a cap on the site to minimize future migration of contaminants, maintenance of the leachate collection system, and careful monitoring of surface and groundwater to confirm that the site continues to pose no health risk should have been made [sic] (Chrysler).

U.S. EPA Response. To date none of the risks identified have been shown to be invalid. The information presented in the FS's and CAA justifies the combination of the sites and

the implementation of an alternative that protects not only human health but also the environment from existing and future threats.

U.S. EPA's recommended Alternative 5 in the CAA meets the objectives of protecting human health and the environment and remedial action goals and is the most cost-effective alternative.

Comment. Orchard and Sunnen endorse the remedial action plan set forth in the adopted final order of the IDEM Board on January 21, 1987, with the understanding that it is substantially similar to U.S. EPA alternative No. 3 with the addition of a slurry wall (Orchard Corp.; Sunnen Co.).

In lieu of its Alternative 5, the U.S. EPA should adopt a corrective action that is similar to Alternative 2 with the exception that a slurry barrier wall, consistent with the state requirements as determined in Cause N-95 adopted by the Indiana Solid Waste Management Board on January 21, 1987, be installed or alternatively a groundwater collection system such as that described in Alternative 4.

U.S. EPA Response. The objective of a groundwater interception system is to prevent contaminated groundwater from migrating offsite. The objective of a slurry wall is essentially the same with the exception that something must be done with the rainfall that ultimately infiltrates into the ground and which could build up behind a slurry wall. The U.S. EPA selected the more active option of collecting groundwater to achieve the objective because of potential infiltration and the added benefit that contaminants can then be removed from the groundwater in the treatment process. The State of Indiana believes the U.S. EPA's alternative is at least as protective as a slurry wall.

Comment. If one assumes that something must be done then the most logical choice would be the low cost access restriction and monitoring alternative identified in the CAA as Alternative 2. Ferro submits that "no action" Alternative 1 should be selected for NSL and if that is rejected Alternative 2 should provide adequate protection and if that is rejected Alternative 4 is the least objectionable of the remaining seven alternatives (Ferro Corp.).

U.S. EPA Response. The U.S. EPA has found that to protect human health and the environment from existing and future threats remediation of the site is necessary. This would include the interception and treatment of contaminated groundwater and the installation of a cap that meets the requirements of RCRA.

Comment. Why can't the Northside site just be monitored for now since studies show that contamination levels are decreasing? (NSL/ECC December 17, 1986 Public Meeting.)

If the distances between the wells and surface waters were increased, travel times may be long enough to allow implementation of remedial actions after monitoring (NSL Steering Committee).

U.S. EPA Response. For results on existing monitoring please refer to responses in Section 4.8 Hydrogeology. The U.S. EPA has looked at the contamination at Enviro-Chem and Northside and at the results in the remedial investigation reports. The U.S. EPA feels the results justify action. The U.S. EPA does not feel that the remedial action goals of protecting human health, welfare and the environment at Northside and Enviro-Chem are met by Alternative 1, Alternative 2 or Alternative 3. CERCLA does not permit U.S. EPA to implement an alternative which allows offsite migration of contaminants. A proposed adequate early warning monitoring system which can be implemented has not been presented to the U.S. EPA.

Comment. Alternative 9, the RCRA landfill, is located on the north side of the Northside site. Since RCRA sites are only placed in those geological locations best equipped to control landfills is the U.S. EPA saying that that area is a good site to put a RCRA landfill (NSL/ECC December 17, 1987 Public Meeting).

U.S. EPA Response. The onsite RCRA landfill was presented in the FS and CAA to expand the range of remediation alternatives. It was proposed for onsite because offsite transportation cost would have made the alternative very expensive. When material at a Superfund site is disposed onsite it must comply with RCRA requirements. What is presented is a Superfund alternative that disposes the material from Northside in an onsite RCRA landfill. The conceptual design of a RCRA landfill includes an expensive, double-lined floor with several feet of clay in addition to the geologic material below it, which is enough to locate the facility as shown in Alternative 9. The existing NSL does not have a bottom liner.

Comment. The misconstruction and improper application of Section 121 of CERCLA requirements has resulted in the rejection of alternatives consistent with the NCP and the recommendation of an alternative which is not cost-effective.

The comparison of leachate and groundwater contaminant concentrations to Indiana Water Quality Standards is not applicable and was improperly applied (Tricil; NSL Steering Committee).

U.S. EPA Response. CERCLA as amended by SARA Section 121 dictates cleanup goals and standards. The treatment of contaminated soils, refuse, leachate, and groundwater in order to permanently and significantly reduce the volume, toxicity, or mobility of contaminants at the NSL/ECC site is preferred. However, the treatment of NSL soils and refuse would be nearly impossible because of the large volume and variety of materials present and the associated high cost. Treatment of ECC soils alone would not significantly reduce the amount of contamination at the combined site.

Since contaminated surface and groundwaters presently are discharging from the site to Finley Creek, contaminant concentrations in leachate and groundwater are of concern. The published criteria are ARAR's which are protective of warm water aquatic life and human health for ingestion of aquatic organisms.

Comment. Parts of Alternative 5 should be implemented as the need arises, while groundwater monitoring continues with time (NSL Steering Committee).

U.S. EPA Response. There is presently the need for capping the landfill and for collecting leachate. Alternative 5 includes groundwater monitoring for the purpose of remedy performance. Concentrations of contaminants in groundwater along the west and south boundaries of the landfill presently exceed ARAR's, so it must be collected and treated.

Comment. The selected EPA Alternative 5 is a complex remedial action (NSL, Inc.).

U.S. EPA Response. The selected alternative for the NSL site effectively mitigates and minimizes threats to, and provides adequate protection of, public health and welfare and the environment. The selected alternative was technically evaluated on the bases of performance, reliability, implementability, and safety, and was determined to be acceptable. Complexity of an alternative is not evaluated outside of the above considerations.

GLT614/24

Appendix A

Appendix A
EVALUATION OF INDIANAPOLIS WATER COMPANY DATA

Since December of 1983, the Indianapolis Water Company (IWC) has periodically collected water samples in Eagle Creek Reservoir watershed, including Finley Creek upstream of the Highway 421 bridge. The samples were analyzed for volatile organic compound content. In this appendix, the total VOC concentrations of the samples taken at the Highway 421 bridge are compared to the estimated streamflow at the site (based on data from the nearest USGS gauge).

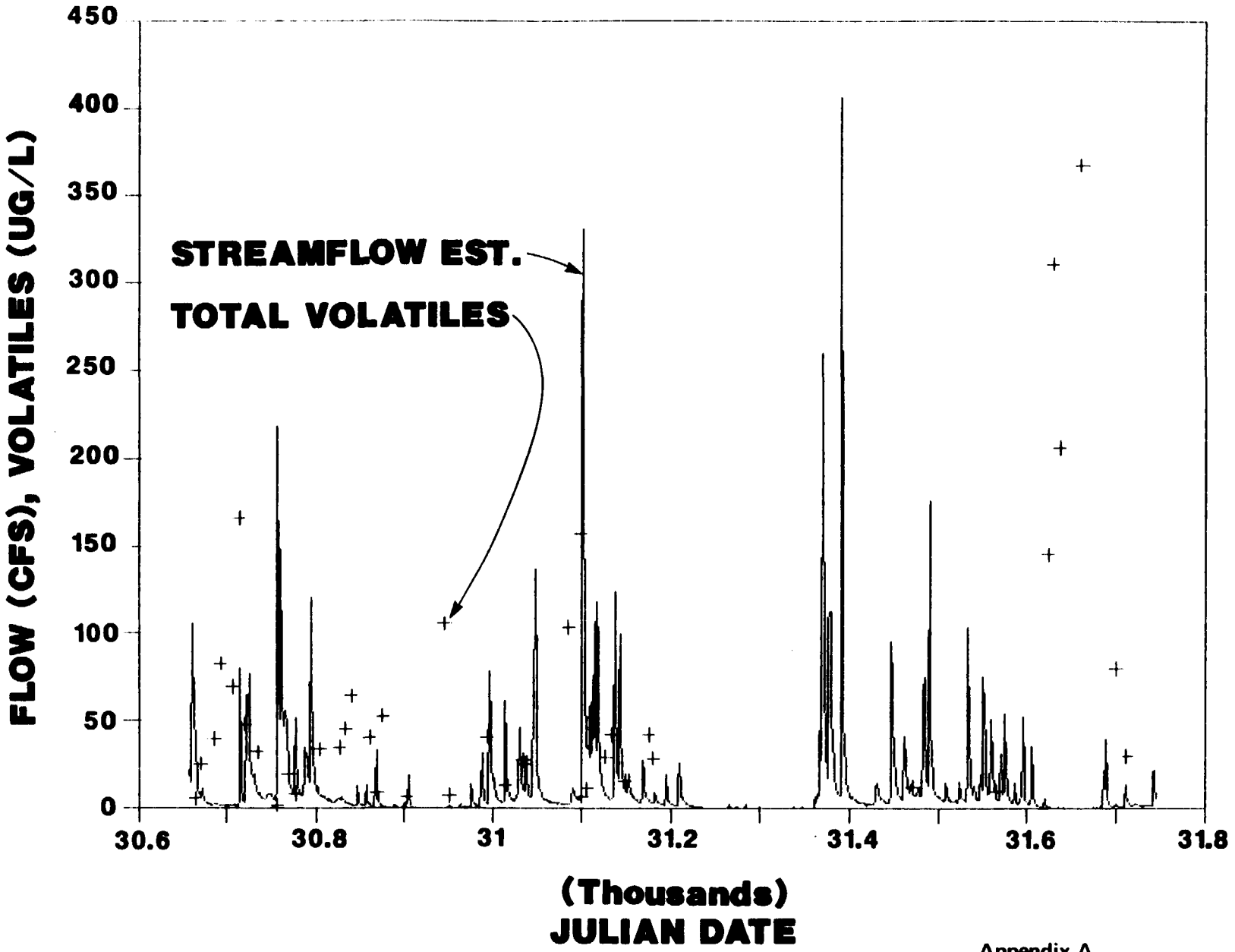
Figure 1 shows the plot of the total VOC's versus time. It also shows the streamflow for each day during the period of December 14, 1986, (Julian Date = 30664) through October 27, 1986, (Julian Date = 31712). The plot shows that the samples were collected during a variety of flow conditions, and higher VOC concentrations tend to be associated with lower flows.

In Figure 2 the stream data has been sorted from highest (left side) to lowest (right side) flow and plotted against the percent of time each flow has been exceeded. The VOC concentration observed when each flow occurred is plotted at the same horizontal plotting position. As shown in Figure 2, the higher VOC concentrations occur when the flows are low.

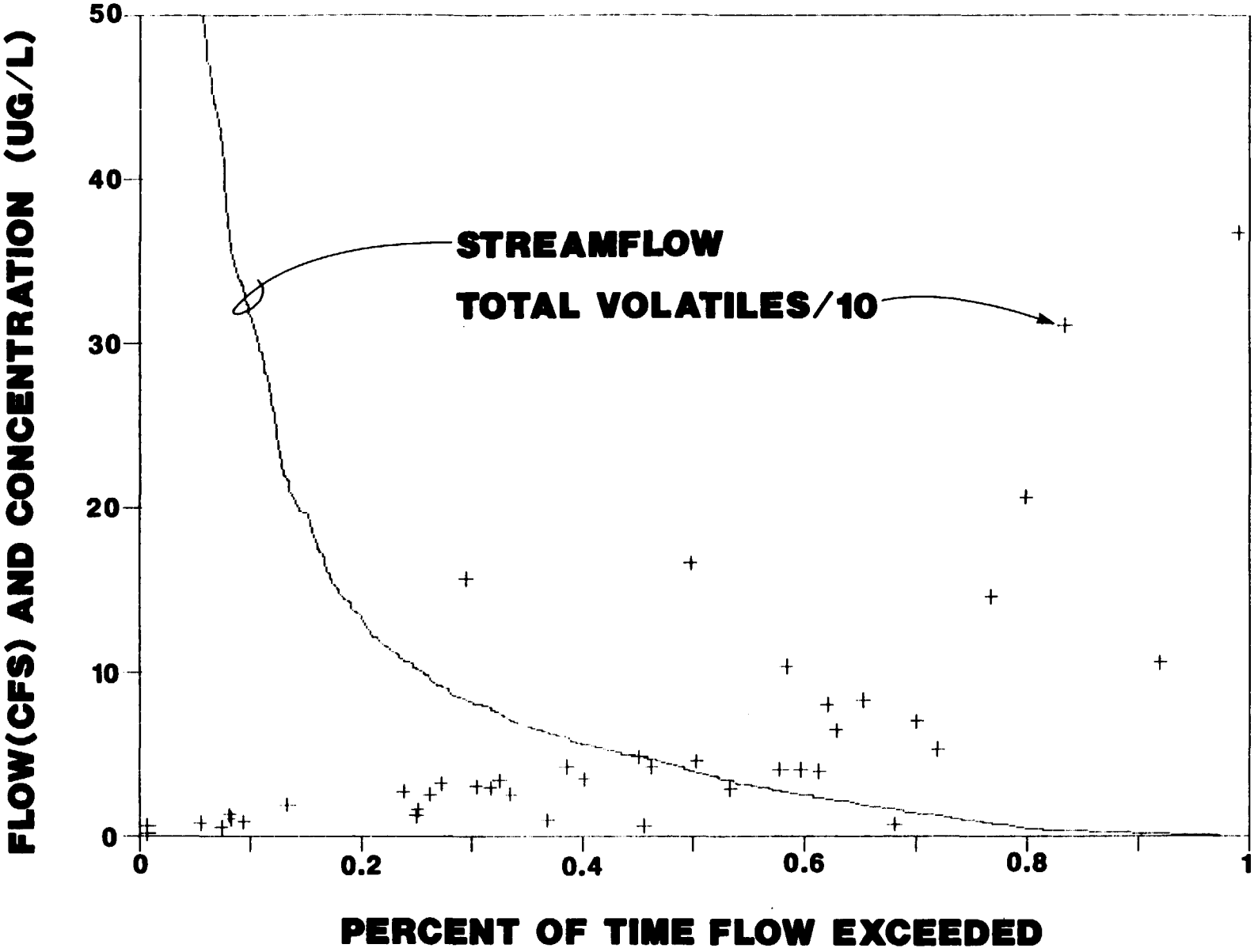
The strength of this observed relationship was statistically evaluated for 1,1,1-tetrachloroethane (1,1,1-TCA). As shown on Figure 3, 1,1,1-TCA was found to relate linearly with the log of the flow with a coefficient of variation of 0.64. This can be interpreted to mean 64 percent of the variation in the 1,1,1-TCA concentration can be directly related to the variation in streamflow.

If the source of the VOC's, and 1,1,1-TCA in particular, were a constant discharge such as from a leaking drum or a point source discharge, then the concentrations should decrease linearly as flow increased and the coefficient in the regression equation would be -1.0 rather than -0.57. If the source were surface runoff, the coefficient would approach 0.0 since concentration would be more independent of flow. The -0.57 indicates some dilution at higher flows. Consequently, the source appears to be affected by factors affecting natural streamflow. The -0.57 coefficient is consistent with that expected of a contaminant transported to the stream through the groundwater--the source quantity varies with streamflow but does not vary as rapidly as surface flow.

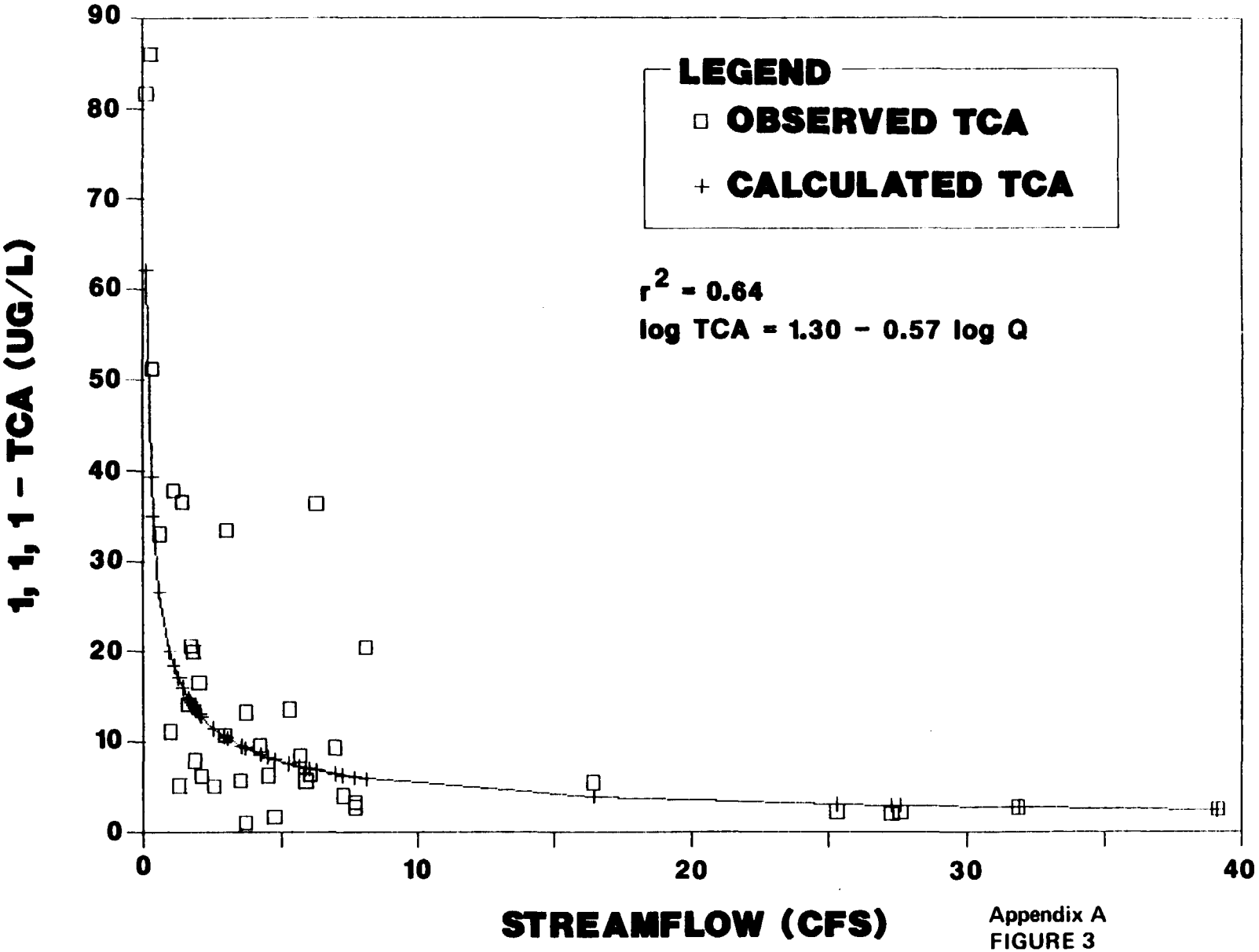
Table A-1 is a summary of the IWC data showing the sampling dates, compounds observed, and concentrations. The table also presents potential risk associated with recreational use of



Appendix A
FIGURE 1
INDIANAPOLIS WATER COMPANY (IWC)
DATA SUMMARY
FLOW AND TOTAL VOLATILES
NSL/ECC RS



Appendix A
FIGURE 2
INDIANAPOLIS WATER COMPANY (IWC)
FLOW FREQUENCY AND TOTAL VOLATILES
NSL/ECC RS



Appendix A
FIGURE 3
INDIANAPOLIS WATER COMPANY (IWC)
DATA SUMMARY
1,1,1-TRICHLOROETHANE (TCA)
VERSUS TOTAL STREAMFLOW
NSL/ECC RS

APPENDIX TABLE A1
INDIANAPOLIS WATER COMPANY DATA FROM 1984 TO 1986 IN MICROGRAMS PER LITER
RESPONSIVENESS SUMMARY

DATE	1,1,1-TCA	1,1-DCA	CIS-1,2-DCE	TCE	PCE	CHLOROFORM	1,1-DCE	DCM	VC	CHLOROETHANE	TOTAL	DETECTED AT EAGLE CREEK INTAKE
14-Dec-83 **	2.8			2.2	0.5						5.5	
20-Dec-83 **	13.6			11.2	0.5						25.3	
05-Jan-84	20			19 (2.2)	0.8						39.8	
12-Jan-84	36.5			44.6	1.7						82.8	
26-Jan-84	37.8			30.4 (1.8)	1.7 (1.1)						69.9	* TCE 1 ug/l
02-Feb-84	33.4		107.2	25.6 (3.8)							166.2	* TCE 0.8 ug/l
09-Feb-84	13.3		27.4 (16.0)	7.6							48.3	
23-Feb-84	9.4		18.5	4.5							32.4	
16-Mar-84	2										2.0	
29-Mar-84	5.5		10.9	3							19.4	
05-Apr-84	2.6		4.9	0.9							8.4	
03-May-84	8.5		22.9	2.6							34.0	
24-May-84	9.7		22.9	2.3							34.9	
31-May-84	10.8		33	2							45.8	
07-Jun-84	14.2		48.2	2.3							64.7	
28-Jun-84	8		30.8	1.9							40.7	
05-Jul-84	2.3		6.8								9.1	
12-Jul-84	11.2		39.9	2.1							53.2	
09-Aug-84	1.1		5.4								6.5	
20-Sep-84	81.7	0.5	0.5	14.7	0.9	6.6	0.5				105.4	
26-Sep-84	5.2	0.5	0.5	1.5							7.7	
08-Nov-84	6.2	3.7	28.9	1.2		0.9					40.9	
29-Nov-84	2.2	1.1	10.2								13.5	* chloroform 1.1 ug/l
19-Dec-84 ***	20.5							7.1			27.6	
20-Dec-84	4.1	1.8	18.3	1.3							25.5	
07-Feb-85	16.6	6.6	73.4 (1.3)	4.6	0.5	1.5 (0.5)		0.5			103.7	* chloroform 0.5 ug/l
21-Feb-85	36.4	6.8	54.8 (0.5)	9.5	1.3 (0.5)			48 (0.5)			156.8	
22-Feb-85	1.8		1.8	0.5				2.6 (0.5)			6.7	
28-Feb-85	2	0.5	8	0.5							11.0	
21-Mar-85	5.7		19.8	1.2			1.4	0.5	0.5		29.1	* DCM 1.7 ug/l
28-Mar-85	6.3	1.9	31.6	0.5		0.5		0.5		0.5	41.8	* DCM 0.5 ug/l and cis -1,2-DCE 0.5 ug/l
12-Apr-85	3.4	0.5	11.5	0.5							15.9	* DCM 0.5 ug/l
08-May-85	5.8	1.5	33.8	0.5					0.5		42.1	
13-May-85 ***	5.1	1.3	7.1	3.3				5	7		28.8	
28-Feb-86	2.8		8.8	0.8							12.4	* cis -1,2-DCE 1 ug/l
02-Jun-86	1.7	0.5	7.2						0.5		9.9	* cis -1,2-DCE 0.5 ug/l
30-Jul-86	33	10.9	99.9	1.9							145.7	
05-Aug-86	86	23.8	191 (0.9)	6.1					4.2		311.1	
12-Aug-86	51.2	13.1	138	2.1					2.2		206.6	
05-Sep-86	176	32.2	138	3			2.2	0.5	11.1		363.0	
15-Oct-86	20.7	5	52.2						0.5	1.8	80.2	
27-Oct-86	6.4	1.1	22.7								30.2	
Average	19.6	6.0	38.2	6.4	1.0	2.4	1.4	8.1	3.3	1.2	62.0	

* Indicates surface water sampling data at Eagle Creek Reservoir intake.
** Indicates surface water sampling data from ECC RI location SW004.
*** Indicates surface water sampling data from NSL RI location SW008.
() Indicates concentrations observed in Eagle Creek at 86th Street.
Note: Compounds detected in trace amounts are entered in the table as 0.5 ug/l for reporting purposes.
Compounds observed only once:
Pentachloroethene detected in Finley Creek at HWY 421 on 9/5/86 at 3.8 ug/l.
Chloromethane detected in Finley Creek at HWY 421 on 9/20/86 at trace levels (recorded as 0.5 ug/l).
Bromoform detected in Finley Creek at HWY 421 on 3/28/86 at trace levels (recorded as 0.5 ug/l).
1,1,2-TCA detected in Finley Creek at HWY 421 on 9/5/86 at 1 ug/l.

	CARCINOGENIC RISKS ATTRIBUTABLE TO AVERAGE CONCENTRATIONS										TOTAL CARCINOGENIC RISK
INGESTION OF FISH	NA	NA	NA	6.5E-08	1.4E-07	6.3E-08	4.0E-07	2.7E-08	7.8E-07	NA	1E-06
INGESTION OF WATER DURING SWIMMING	NA	NA	NA	1.0E-09	7.6E-10	2.9E-09	1.2E-08	9.1E-10	1.1E-07	NA	1E-07
DERMAL ABSORPTION DURING WADING	NA	NA	NA	2.4E-08	1.7E-08	6.5E-08	2.8E-07	2.1E-08	2.6E-06	NA	3E-06
TOTAL				9E-08	2E-07	1E-07	7E-07	5E-08	3E-06		5E-06

Finley Creek upstream of Hwy 421 bridge due to the calculated average concentration of the various VOC's observed.

Table A-2 is the presentation of sampling results from a June 8 and 9, 1987, reconnaissance of Finley Creek and unnamed ditch. The sampling locations correspond to those shown in Figure 4.

GLT614/30

06-Sep-87

APPENDIX TABLE A2
NSL/ECC SURFACE WATER DATA
RECONAISSANCE SAMPLING TRIP
RESPONSIVENESS SUMMARY

Sample Point:	SW-1	SW-2	SW-3	SW-3	SW-3	SW-4	SW-12	SW-30	SW-5	SW-5	SW-9	SW-10	SW-14
Sample Location:	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/DWN	FC/UP	FC/UP	FC/BKGRN
Sample Number:	SW101-01	SW102-01	SW103-01	SW103-02	SW103-03	SW104-01	SW112-01	SW130-01	SW105-01	SW105-02	SW109-01	SW110-01	SW114-01
Date Sampled:	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87
Control Number:	C2257	C2258	C2259	C2260	C2261	C2263	C2264	C2265	C2266	C2267	C2272	C2273	C2277
ORGANIC COMPOUNDS (ug/l)													
VOLATILES													
BENZENE								1 J					
ETHYLBENZENE								18.2					
CHLOROBENZENE								41					
1,2-DICHLOROBENZENE	0.5 *	0.5 *	0.5 *	0.5 *	1.3 J	0.5 *		31					
CHLOROETHANE	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *		189					
1, 1-DICHLOROETHANE	1.4 J	1.5 J	1.6 J	1.6 J	1.5 J	1 J		149					
1, 2-DICHLOROETHANE								0.5 *					
1, 1, 1-TRICHLOROETHANE	5	5.5	5.4	6.8	6.3	4.9		108					
1, 1, 2-TRICHLOROETHANE													
1, 1-DICHLOROETHENE	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *		7.1					
TRANS-1, 2-DICHLOROETHENE	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *		12.4					
CIS-1, 2-DICHLOROETHENE	19	21	21	22	23	19		164					
TRICHLOROETHENE	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *			16.4					
TETRACHLOROETHENE								4.1					
CHLOROMETHANE													
METHYLENE CHLORIDE (DCM)													
TOLUENE								9					
VINYL CHLORIDE	1.4 J	1.5 J	1.5 J	1.6 J	1.6 J	1.6 J		59					
ACETONE													
2-BUTANONE (MEK)													
4-METHYL-2-PENTANONE (MIBK)													
STYRENE													
TETRAHYDROFURAN								45					
UNKNOWN COMPOUND													
m-XYLENE								76					
TOTAL VOLATILES	29.3	32	32	34.5	35.7	28.5	0	930.7	0	0	0	0	0
CONDUCTIVITY (umhos/cm2)	592	544	576	576	576	528	560	1280	576	576	576	469	544
TEMPERTURE (C)	25	25	25	25	25	26	27	26	28	28	27.5	26	25

FOOTNOTES:

* - Indicates compound positively indetified , concentration is estimated to be less than 1 ug/l (0.5 entered in table for reporting purposes).
J - Indicates compound positively identified , concentration is estimated.

APPENDIX TABLE A2
NSL/ECC SURFACE WATER DATA
RECONAISSANCE SAMPLING TRIP
RESPONSIVENESS SUMMARY

Sample Point:	SW-11	SW-6	SW-7	SW-8	SW-13	SW-13	SW-31	SW-31	SW-15	SW-16	SW-32	SW-32	SW-32
Sample Location:	FC/BKGRN	UD/DWN	UD/DWN	UD/DWN	UD/DWN	UD/DWN	ECC SUMP	ECC SUMP	UD/UP/ECC	UD/BKGRN	NSL SEEP	NSL SEEP	NSL SEEP
Sample Number:	SW111-01	SW106-01	SW107-01	SW108-01	SW113-01	SW113-02	SW131-01	SW131-02	SW115-01	SW116-01	SW132-01	SW132-02	SW132-03
Date Sampled:	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-8-87	6-9-87	6-9-87	6-9-87	6-9-87	6-9-87	6-9-87	6-9-87
Control Number:	C2276	C2268	C2270	C2271	C2274	C2275	C2280	C2281	C2278	C2279	C2282	C2283	C2284
ORGANIC COMPOUNDS (ug/l)													
VOLATILES													
NZENE		0.5 *					3.9	4.2					
THYLBENZENE							36	42					
LOROBENZENE							1.8 J	1.6 J					
2-DICHLOROBENZENE							34	38					
LOROETHANE		68	2.1	5.8	12.9	16.4	180	200			12.1	9.2	
1-DICHLOROETHANE		27	0.5 *	0.5 *	2.2	2.5	6450	5900				0.5 *	
2-DICHLOROETHANE		0.5 *					59	49					
1, 1-TRICHLOROETHANE		0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	8100	6890				0.5 *	
1, 2-TRICHLOROETHANE							71	77					
1-DICHLOROETHENE							1100	1150					
ANS-1, 2-DICHLOROETHENE		0.5 *					220	200					
S-1, 2-DICHLOROETHENE		24	0.5 *	0.5 *	1 J	1.2 J	17500	15200				0.5 *	
ICHLOROETHENE		0.5 *					113	120					
TRACHLOROETHENE							56	61					
LOROMETHANE											22	10	
THYLENE CHLORIDE (DCM)													
LUENE							1290	1020					
NYL CHLORIDE		15			0.5 *	0.5 *	580	600			1.2 J/1.4 J	1.2 J	
ETONE		124	101	113	97	113	420	450	110				
BUTANONE (MEK)		86	73	86	88	93	820	880	96				
METHYL-2-PENTANONE (MIBK)							212	226					
TENE							3.2	3.7					
TRAHYDROFURAN											95	90	
KNOWN COMPOUND													10 - 50
YLENE							375	420					
TAL VOLATILES	0	346.5	177.6	206.3	202.1	227.1	37624.9	33532.5	206	0	130.3 / 130.5	111.9	10 - 50
NDUCTIVITY (umhos/cm2)	560	967	848	864	848	848	560	560	880	786	1966	1966	1966
MPERTURE (C)	24.5	29	28	28	26	26	23	23	24	23	22	22	22

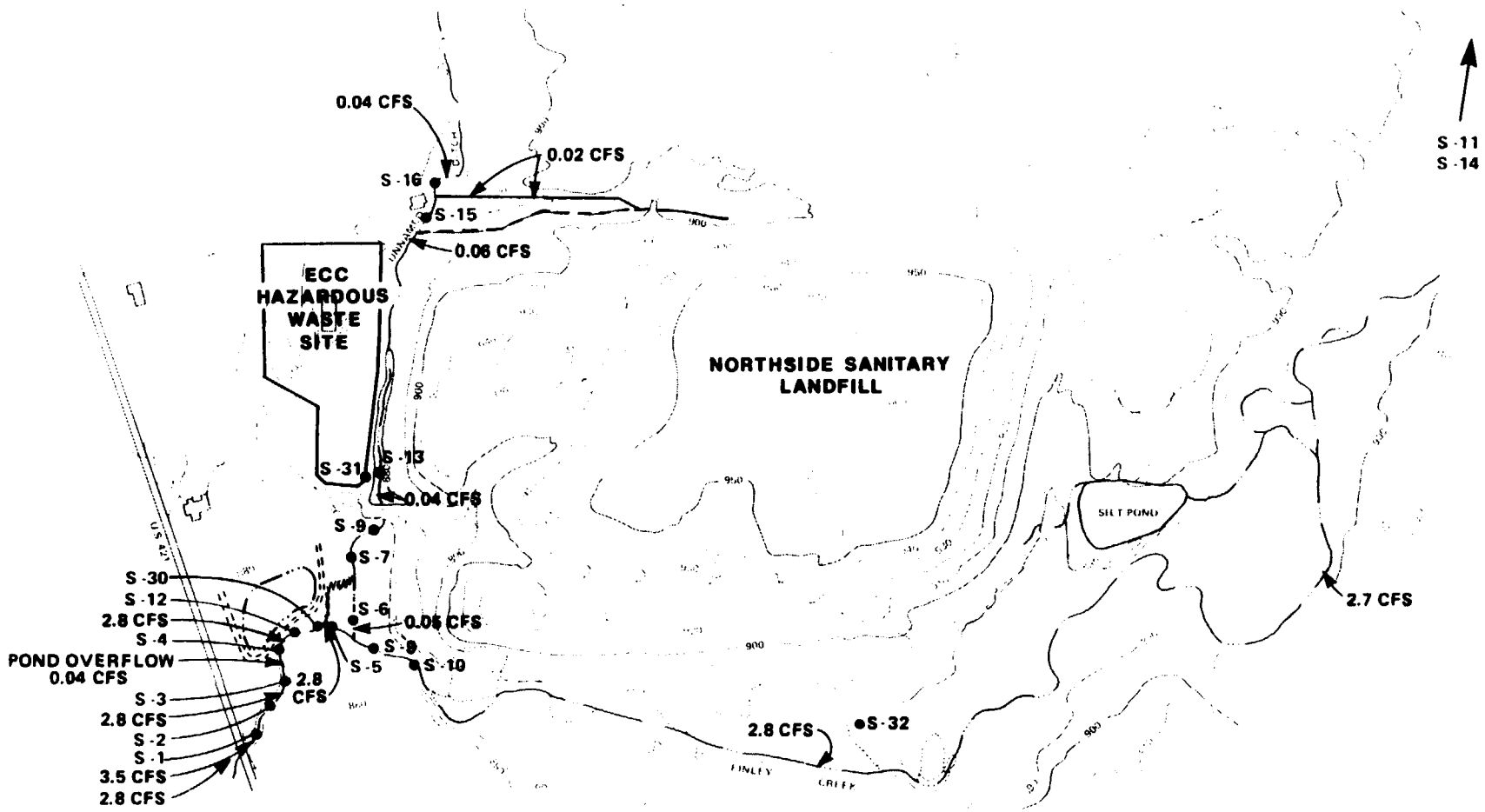
FOOTNOTES:

* - Indicates compound positively indetified , concentration is estimated to be less than 1 ug/l (0.5 entered in table for reporting purposes).
J - Indicates compound positively identified , concentration is estimated.

APPENDIX TABLE A2
NSL/ECC SURFACE WATER DATA
RECONAISSANCE SAMPLING TRIP
RESPONSIVENESS SUMMARY

Sample Point: / Sample Location:	BLANK	BLANK
Sample Number:	BLANK	BLANK
Date Sampled:	6-8-87	6-8-87
Control Number:	C2262	C2269
ORGANIC COMPOUNDS (ug/l)		
VOLATILES		
BENZENE		
ETHYLBENZENE		
CHLOROBENZENE		
1,2-DICHLOROBENZENE		
CHLOROETHANE		
1, 1-DICHLOROETHANE		
1, 2-DICHLOROETHANE		
1, 1, 1-TRICHLOROETHANE		
1, 1, 2-TRICHLOROETHANE		
1, 1-DICHLOROETHENE		
TRANS-1, 2-DICHLOROETHENE		
CIS-1, 2-DICHLOROETHENE		
TRICHLOROETHENE		
TETRACHLOROETHENE		
CHLOROMETHANE		
METHYLENE CHLORIDE (DCM)		
TOLUENE		
VINYL CHLORIDE		
ACETONE		
2-BUTANONE (MEK)		
4-METHYL-2-PENTANONE (MIBK)		
STYRENE		
TETRAHYDROFURAN		
UNKNOWN COMPOUND		
m-XYLENE		
TOTAL VOLATILES	0	0
CONDUCTIVITY (umhos/cm2)	N/A	N/A
TEMPERTURE (C)	N/A	N/A

FOOTNOTES:



Appendix A
FIGURE 4
JUNE 1987
SAMPLING LOCATIONS
NSL/ECC RS

Appendix B

Appendix B
INDEX OF COMMENTS RECEIVED

Representing	Site	Date	By
ECC Technical Steering Committee	ECC	2/12/87 & 2/27/87	ECC Technical Committee ERM
NSL Technical Steering Committee	NSL	2/28/87	Barnes & Thornburg ERM
Jeffboat	NSL/ECC	2/27/87	Baker & Daniels ETS
Rock Island Refining Corp.	NSL/ECC	2/27/87	Baker & Daniels ETS
NSL, Inc.	NSL	2/28/87	Parr, Richey, Obremskey & Morton West
TRW, Inc.	NSL/ECC	2/27/87	TRW
Tricil Environmental Services, Inc.	NSL/ECC	2/27/87	Mishkin, Cromer, Eaglesfield & Maher P.A. Geraghty & Miller
Mersman Waldron Comfort Tables	ECC	2/27/87	Dunlevey, Mahan & Furry
Orchard Corp.	ECC	2/12/87	Orchard Corp.
Sunnen Products Co.	ECC	2/23/87	Sunnen Products Co.
City of Indianapolis	NSL	2/27/87	City of Indianapolis
Jones Chemicals, Inc.	NSL/ECC	2/27/87	Nixon, Hargrave, Devans & Doyle
Chrysler Motors Corp.	NSL	2/25/87 & 3/2/87	Chrysler Motors Corp.
Thermoset Plastics, Inc.	NSL/ECC	12/31/87	Thermoset Plastics, Inc.
Ferro Corp.	NSL	2/26/87	Squire, Sanders & Dempsey
Metalworking Lubricants Co.	NSL/ECC	2/27/87	Metalworking Lubricants Co.
Sierra Club, Hoosier Chapter	NSL/ECC	2/14/87	Garelick, Cohen & Fishman
Citizens Environmental Council	NSL/ECC	2/10/87 & 2/24/87	Douglas F. Johnstone, M.D.
Themselves	NSL/ECC	1/12/87	Richard and M. Elizabeth Idler
Herself	NSL/ECC	1/28/87	Dee Fox
Toxic Action Project	NSL/ECC	None	Grant Smith, Coordinator